DxMONITOR

Animal Health Report

Inside this Issue

Summer 1994

The DxMONITOR Animal Health Report is distributed quarterly as part of the Veterinary Diagnostic Laboratory Reporting System (VDLRS). The VDLRS is a cooperative effort of the American Association of Veterinary Laboratory Diagnosticians (AAVLD), the United States Animal Health Association (USAHA), and the United States Department of Agriculture, Animal and Plant Health Inspection Service (USDA:APHIS). The purpose of the DxMONITOR is to report trends of confirmed disease diagnoses and animal health data collected from veterinary diagnostic laboratories and the USDA:APHIS.

Caution should be taken when extrapolating information reported in the DxMONITOR due to the inherent biases of submitted specimens. Trends should be interpreted with care. An increase in the number of positive tests for a given diagnosis/agent may be the result of a true increase in prevalence, or, it may only reflect a new State testing requirement, a heightened awareness of the condition, or an increase in the number of laboratories reporting data.

New for this issue: The disease reporting period for new data was January 1 through March 31, 1994.
Data have been reported by diagnostic laboratories in the States indicated on the inside back cover, the National Veterinary Services Laboratories (NVSL), and the APHIS:Veterinary Services program staffs.

Test results are now presented as the number positive over the total number tested per state on U.S. maps and total percent positive for several quarters to facilitate geographic and temporal comparison. Laboratory reported diseases in Section I are reported as percent of tests. Diseases in Section II are reported as percent of accessions. Increases in denominators may be a reflection of the addition of new labs and/or labs reporting additional diseases not previously reported.

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Lab Notes

This section presents short descriptions of current investigations, outbreaks, or events of potential interest to diagnostic laboratories. The purpose is to provide a forum for timely exchanges of information about veterinary diagnostic laboratory activities. Submissions from nonparticipating laboratories are welcome.

Emerging Acute/Peracute Clinical Disease Outbreaks Associated with BVD Virus

Recent reports suggest cattle herds in the U.S. are being affected by atypical bovine viral diarrhea (BVD) virus with the disease occurring in cows as well as calves and heifers, and with higher than expected morbidity and mortality. This acute/peracute manifestation is characterized by high mortality and clinical signs including the following: high fever (107 degrees F or higher), anorexia, decreased milk production (in dairy cattle), occasional diarrhea, respiratory signs, and death within 48 hours of onset.

Evidence exists that a similar BVD outbreak occurred in Canada, starting early in 1993. Ontario reports of multiple herds with peracute disease and high death loss in both young and adult cattle, as well as other acute forms of BVD, have been verified by a survey of veterinarians, BVD laboratory submissions, and rendering data. While overall laboratory submissions at Ontario Veterinary Laboratory Services have remained relatively constant, submissions with evidence of BVD disease increased almost three-fold in 1993 compared to 1991-92. In addition, Ontario rendering data show a 60 percent increase in numbers of dead calves picked up in 1993 as compared to 1992.

Two distinct biotypes of BVD virus have previously been identified: cytopathic and noncytopathic. Persistent infection with noncytopathic BVD has been recognized and both biotypes are isolated from classical mucosal disease.

Acute and peracute nonmucosal clinical presentations appear to be associated with a BVD virus that has major genomic differences from the virus that causes classic BVD. Researchers at USDA:Agriculture Research Service:National Animal Disease Center have tentatively labelled the classic BVD Type 1 and the other genomic form Type 2. Canadian peracute outbreaks have been associated with a noncytopathic BVD classified as type 2. Both biotypes (cytopathic and noncytopathic) occur in each of the genomic types (Type 1 and Type 2).

The clinical picture of BVD is varied and diverse and includes the following disease syndromes. Prenatal BVD infections can lead to abortions, mummifications, stillbirths, birth of weak calves, or, in other cases, persistent infection in surviving calves. Persistently infected calves, if later infected with a cytopathic BVD virus, may develop mucosal disease (with oral and gastrointestinal ulcers and diarrhea) or chronic debilitating disease. Acute BVD, alternatively, results from postnatal BVD infection. Often the result is subclinical or mild clinical disease. Other acute BVD presentations include hemorrhagic syndrome (with thrombocytopenia, fever, diarrhea, particularly in calves) or peracute disease (with fever of 107-110 degrees F, anorexia, occasional diarrhea, and respiratory disease in all ages of cattle often resulting in death within 48 hours of onset).

The USDA:Animal and Plant Health Inspection Service: Veterinary Services is working with ARS, universities, and diagnostic laboratories to gain further information related to an outbreak in Pennsylvania and to further clarify the situation in North America.

Laboratories participating in the Veterinary Diagnostic Laboratory Reporting System (VDLRS) and selected non-participating laboratories were contacted for their input on observed BVD manifestations in the last 12 months. Twenty-nine veterinary diagnostic laboratories in 28 States reported observations of BVD cases which were confirmed, suspected but not confirmed, and not seen (for several manifestations). For each, they were asked to indicate if the numbers seen increased, decreased, or showed no change from previous years.

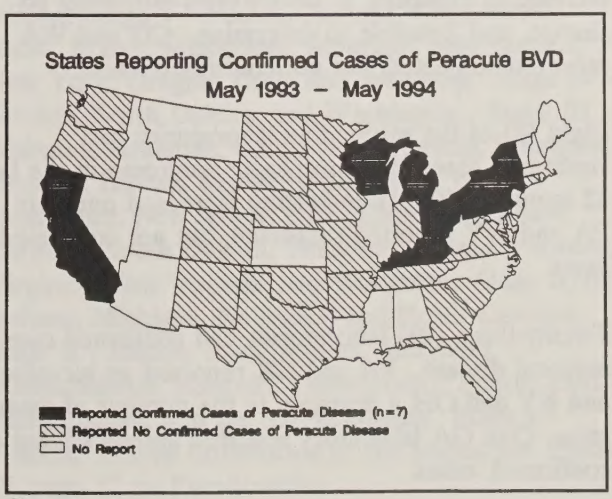


Figure 1

Table 1.

Lab Location	Peracute	Hemorrhagic	Mucosal	Abortion	Unknown	Other
Arkansas	N	N	N	S=	S	
California	C=	N	C=	C>	C>	C
Colorado	S=	N=	C=	C=		
Connecticut			C			
Florida	N	N	C=	S=	N	C=
Georgia*	N	N	CS=	CS=	N	C=
Indiana	N=	C=	C=	N	C=	C>
Kentucky	C=	N=	C<	S=	C<	C<
Michigan	C	C	C	C	C	
Minnesota	N	N	C=	C=	C	C=
Missouri	N	N=	C=	C=		
North Dakota	N	C	C=	C=	C=	C=
Nebraska	N	N				
New Mexico	N	N	N	S		
New York	C>	C>	C=	C=		
Ohio	C=	N	C<	C<	C=	C=
Oklahoma	N	N=	C>	S=	C=	
Oregon	N	N	C=	C=	C=	
Pennsylvania	C>	S>	C>	C>	C>	C>
South Carolina	N	N	N	N	N	
South Dakota	N	C=	C=	C=	N	C=
Tennessee	N	N	C=	C=		
Texas	N	N	C=	C=	C=	
Virginia	N=	C=	C=	N	N	
Washington	S=	C=	C=	C=	C=	C=
Wisconsin	C	C	C	C	C	C
Wyoming	N	S	C	C	C	C

C=Confirmed, S=Suspected, but not confirmed, N=Not seen
>-Increased numbers, <-Decreased numbers, =-No change
* Georgia had 2 laboratories report findings.

Figure 1 and Table 1 show a breakdown of conditions reported by State. Laboratories in 7 States (CA, KY, MI, NY, OH, PA, WI) reported confirmed cases of peracute disease with PA and NY indicating an increase in numbers, 3 laboratories indicating no change, and 2 unable to determine. CO and WA reported suspected, but not confirmed, cases.

Eight (8) of the responding laboratories had confirmed cases of hemorrhagic syndrome in the last 12 months, with NY indicating increased numbers. PA and WY reported suspected, but not confirmed, cases.

Twenty-three (23) laboratories had confirmed cases of mucosal disease. PA and OK reported an increase and KY and OH a decrease in the number of cases seen. One GA laboratory reported suspected, but not confirmed, cases.

Seventeen (17) laboratories had confirmed cases of BVD-associated abortions. PA and CA reported an increase and OH a decrease in cases. Six (6) laboratories reported suspected, but not confirmed, cases.

Fourteen (14) laboratories had confirmed cases of BVD where the history was unknown. PA and CA reported an increase and KY a decrease. AR reported suspected, but not confirmed, cases.

Thirteen (13) laboratories had confirmed cases of BVD where the history did not fit any of the definitions above. PA and IN reported an increase and KY a decrease. The most commonly cited history was in association with bovine respiratory disease.

All responding laboratories indicated they are able to use more than one test to confirm BVD. Virus isolation is used by 26 laboratories and 2 laboratories

send their isolations out of State. Fluorescent antibody on tissue sections is used by 27 laboratories. Serology is used by 25 laboratories, although most do not use serology alone. Histopathology is used by 25 laboratories. Gross pathology is used by 21 laboratories. Other methods used by 3 of the laboratories include immunohistochemistry, immunoperoxidase, and polymerase chain reaction. Immunohistochemistry and antigen capture techniques are being developed by some laboratories.

Traditional serum neutralization techniques include only Type 1 virus and give a very low titer for Type 2. If Type 2 virus is used rather than Type 1, the titer seen will be 10-100 times higher. Traditional FA techniques use only Type 1 conjugate and give little to no fluorescence if Type 2 virus is present. Since the virus is nonpathogenic, there will also be no change in the cell culture. The National Veterinary Services Laboratories (NVSL) will be able to provide Type 2 virus and conjugate for SN and FA in the near future. When ordering, specify that Type 2 BVD is desired.

Laboratories were asked if they had stored BVD isolates that could be forwarded to NVSL for further characterization. Seventeen laboratories indicated they had or could save isolates for NVSL. This information will be passed on to NVSL for follow-up.

Recommended management practices to control BVD include: 1) modified live virus vaccination of breeding females prior to breeding to protect against fetal infection; 2) limiting movement of cattle on and off the farm to essential traffic. Maintain a closed herd to the extent possible. (If not possible, test cattle prior to entry into the herd); 3) isolate newly purchased and sick cattle, 4) avoid overcrowding, stressing, and mixing of cattle, 5) identify and remove persistently infected cattle from the herd. NOTE: Effectiveness of these techniques relative to peracute BVD disease is unclear.

To date, reports from Ontario animal health officials, certain U.S. veterinary diagnostic laboratories, and university personnel indicate that outbreaks of acute/peracute BVD have typically occurred in herds with a history of no or inadequate BVD vaccination. Single initial doses of a killed vaccine are inadequate, even if vaccination is boosted annually. While adequate vaccination appears to protect the cow from severe disease and death, it may not always protect the fetus. Most current vaccines contain only Type 1 BVD virus, but there does appear to be some cross-protection against Type 2 BVD virus, at least for a limited period.

Killed virus vaccines require a two-dose priming vaccination series, followed by frequent revaccination (e.g., as often as every 3-4 months) and are safe for use in pregnant cattle. Modified-live vaccines have the advantage of needing only a single initial dose, but should not be used in pregnant cattle or cattle in contact with pregnant cattle. Consideration should be given to vaccination of new arrivals upon entry into the herd. Good biosecurity measures should be maintained and incoming animals should be isolated from the rest of the herd until their health status is proven.

Contact: Dr. Larry Paisley, USDA:APHIS:VS, Scotia, NY, (518) 370-5026, or Dr. Scott Wells, USDA:APHIS:VS, Fort Collins, CO, (303) 490-7800.

Bovine Brucellosis, Tuberculosis, and Pseudorabies State Classification Changes

State classifications presented here may not coincide with information presented in the Selected Diseases section because they were obtained from press releases with later dates than the official reports used to generate the information.

Bovine Brucellosis: California advanced to Free status on April 7, 1994. There were 33 States, Puerto Rico, and the Virgin Islands that were bovine brucellosis free; 17 States were Class A; and no States remained in Classes B or C.

Tuberculosis: New York returned to accredited-free status on June 21, 1994.

Pseudorabies: Idaho, Montana, and Oregon advanced to Stage V (Pseudorabies Free); New Jersey, South Dakota, and all but six counties in Michigan advanced to Stage III; Iowa and Rhode Island advanced to Stage II on May 20, 1994.

As of May 20, 1994, State Classifications were as follows: Stage V - Alaska, Arizona, Connecticut, Idaho, Maine, Mississippi, Montana, New Mexico, New York, Oregon, Utah, and Wyoming. Stage IV - Nevada, North Dakota, and Washington. Stage III - Alabama, Arkansas, California, Colorado, Delaware, Georgia, Hawaii, Kentucky, Louisiana, New Hampshire, New Jersey, Ohio, Oklahoma, South Carolina, South Dakota, Tennessee, Texas, Vermont, Virginia, West Virginia, and Wisconsin. Stage II/III - Indiana, Michigan, Nebraska, and North Carolina. Stage II - Illinois, Iowa, Kansas, Maryland, Massachusetts, Missouri, Pennsylvania, Puerto Rico, Rhode Island, and the Virgin Islands. Stage I - Florida. For an explanation of the stages, see Figure 25, page 17 on Pseudorabies.

Source: USDA Press Releases, April 7, May 20, and June 21, 1994.

Avian Influenza Virus Infection in Live-Bird Markets: January Through March 1994

Between January and March 1994, Veterinary Services personnel conducted their quarterly survey for avian influenza virus (AIV) in poultry in live-bird markets. The presence of AIV hemagglutinin (H) subtype 5 or 7 (H5 or H7) in birds is a concern. Historically the two subtypes have caused outbreaks of highly pathogenic avian influenza. The survey included live-bird markets and backyard flocks in Connecticut, Massachusetts, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, and Vermont.

Of the eight States surveyed, AIV subtype H7N2 was isolated from seven live-bird markets in New York and three in New Jersey. AIV subtype H7N3 was recovered from one live-bird market in New Jersey. The AIV H7 subtypes were isolated predominantly from chickens. The virus was also isolated from two turkeys, one pheasant, one guinea fowl, one duck, and two environmental specimens. In subsequent tests, AIV H7N2 was again isolated from three live-bird markets in New York.

The AIV subtypes H7N2 and H7N3 were not pathogenic. Chickens experimentally inoculated by the intravenous route with the virus subtypes remained apparently healthy throughout the 8-day observation period. Molecular characterization of the H7N2 and H7N3 subtypes at St. Jude Children's Research Hospital, Memphis, Tennessee, revealed that the amino acid sequence in the hemagglutinin cleavage site was similar to that in nonpathogenic subtypes. In conclusion, the AIV subtypes H7N2 and H7N3 isolated from live-bird markets in New York and New Jersey were nonpathogenic.

Contact: Dr. Brundabon Panigrahy, Diagnostic Virology Laboratory, National Veterinary Services Laboratories, Ames, IA, (515) 239-8551.

Salmonella enteritidis (SE) Update

Table 2 shows a breakdown of the number of human SE outbreaks investigated by the USDA:APHIS:VS SE Control Program and the number of outbreaks which were egg-implicated (of egg origin) from 1990 to present.

Table 2.

Year	Total	Egg- Implicated
1990	70	22
1991	68	13
1992	59	26
1993	62	21 (4 pending)
1994	1	0

Only one human SE outbreak had been reported for 1994 as of June 7, and it was not egg related. The majority of human SE outbreaks are reported during the summer months.

Table 3 shows the 20 most frequently reported *Salmonella* serotypes from human sources reported to the Centers for Disease Control (CDC) in 1992. Numbers for 1993 are not yet available. There has been an overall decrease in isolates for all *Salmonella* and in the most prevalent serotypes in the last few years.

Table 3.

Serotype	Number	Percent
S. typhimurium	7894	22.9
S. enteritidis	6547	19.0
S. heidelberg	2519	7.3
S. hadar	1526	4.4
S. newport	1478	4.3
S. agona	748	2.2
S. thompson	689	2.0
S. javiana	646	1.9
S. oranienburg	595	1.7
S. montevideo	558	1.6
S. saintpaul	525	1.5
S. infantis	498	1.4
S. braenderup	475	1.4
S. muenchen	447	1.3
S. typhi	446	1.3
S. reading	429	1.2
S. berta	331	1.0
S. poona	217	0.6
S. derby	198	0.6
S. brandenburg	187	0.5

Contact: USDA:APHIS:VS, SE Control Program staff, Hyattsville, MD, (301) 436-4363.

I. Patterns of Selected Diseases

Section I contains information on diseases of interest as designated by List B of the Office International des Epizooties (OIE). The purpose of reporting these data is to monitor confirmed cases of specific diseases on a State-by-State or regional basis so that national distributions can be mapped and evaluated.

Key to Figures in this Section:

- **The percents positive presented here are the number of positive tests out of the total number of tests run and should not be interpreted as disease prevalence or incidence rates.**
- **In some cases, the denominator is a minimum because some laboratories were not able to determine the total number of negative tests performed.**
- **Data are presented by region or State of specimen origin and quarter year of specimen submission.**
- **Results reported with dates not corresponding to the current quarter are the result of different testing intervals or related to different reporting times.**
- **See map on inside back cover for regions.**

☐ Bovine Leukosis

Criteria: AGID or pathology.

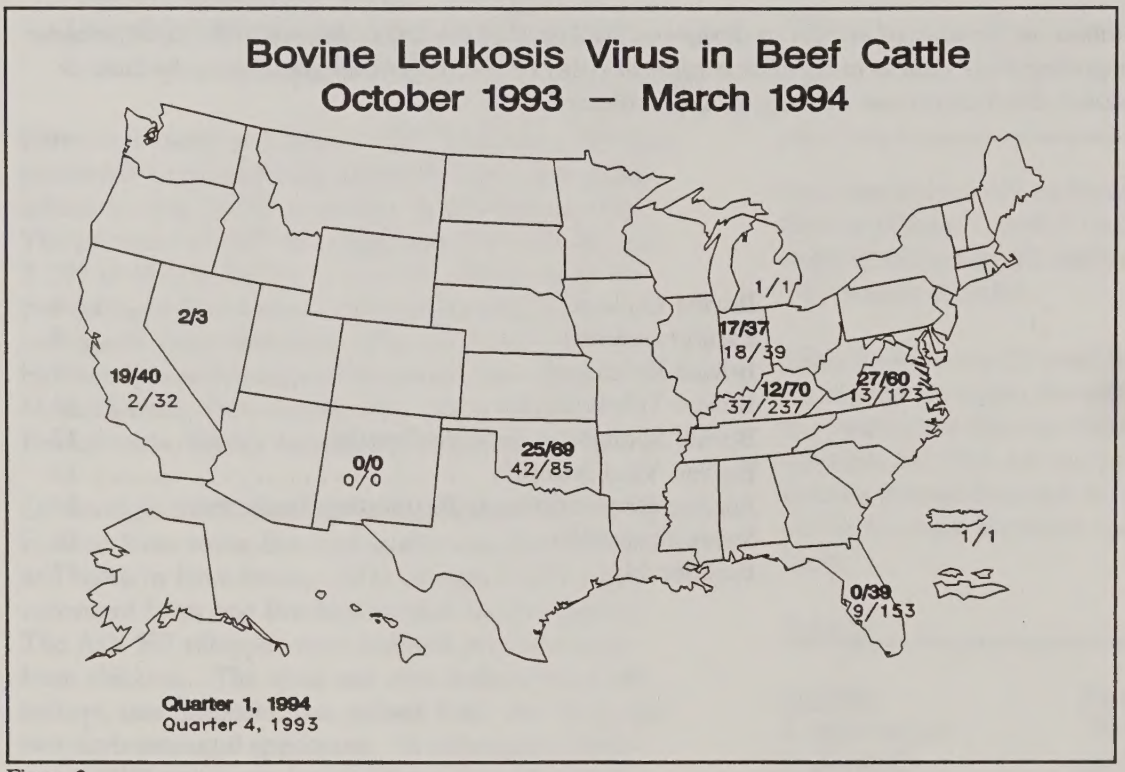


Figure 2

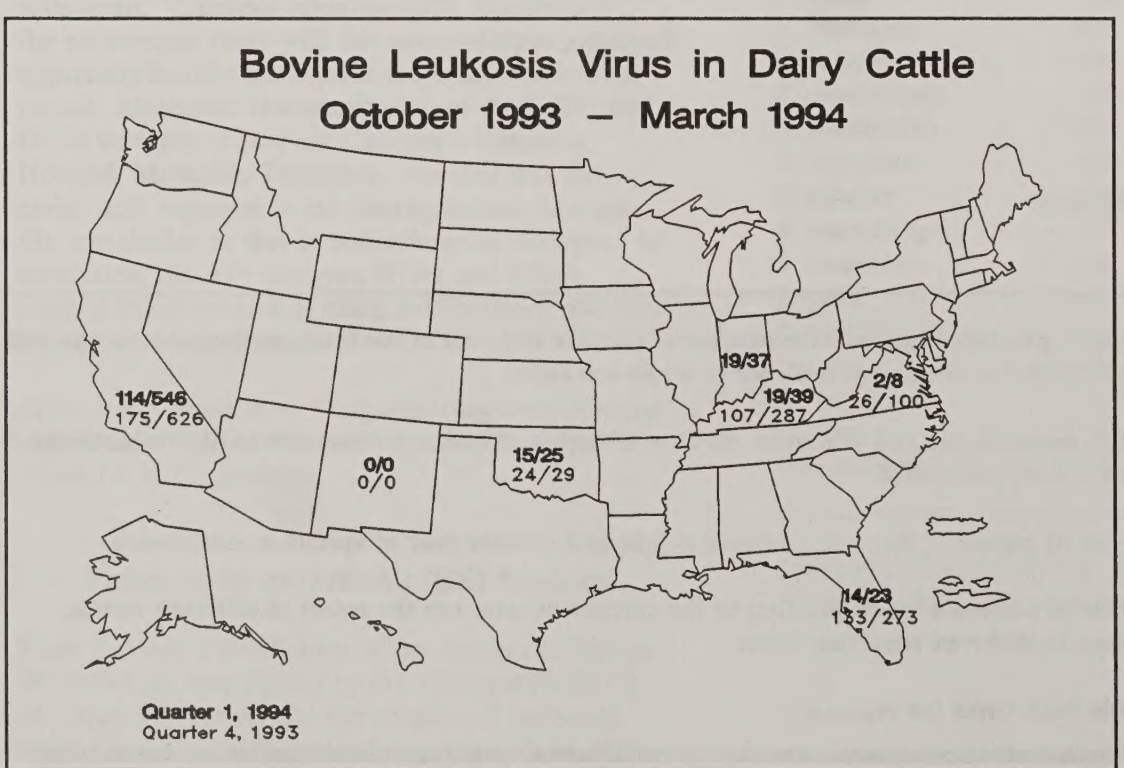


Figure 3

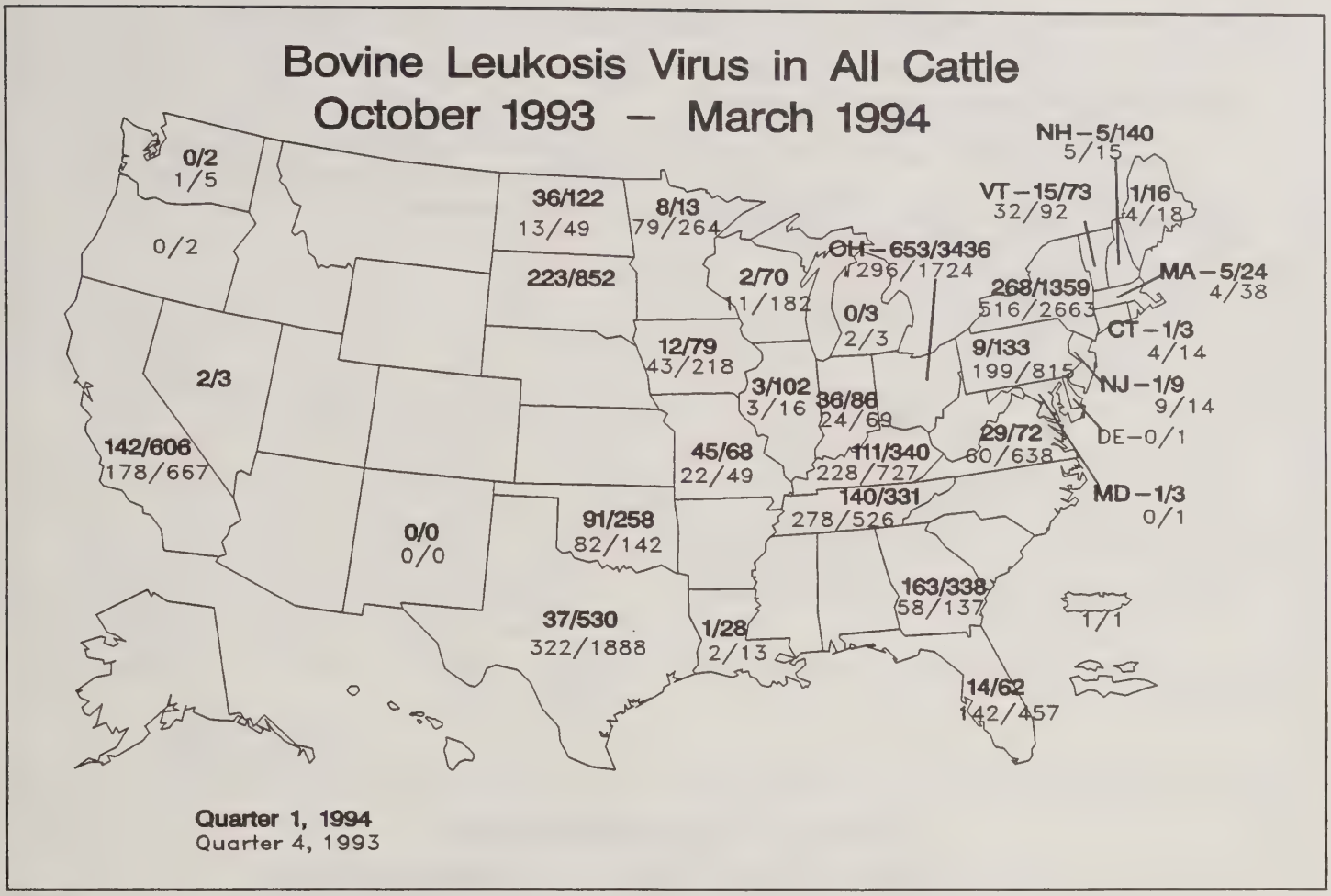


Figure 4

For the first quarter of 1994 (January through March), there were 2,054/9,161 (22.4 percent) positive tests for BLV compared to 2,618/11,448 (22.8 percent) for the fourth quarter of 1993 and 2,884/11,833 (24.4 percent) for the first quarter of 1993. Figures 2 through 4 show the distribution of BLV test results for the fourth quarter of 1993 and first quarter of 1994 in beef, dairy, and all cattle by State. Figure 4 includes results where the class was unknown. Figure 5 shows a comparison of the total percent positive by quarter. Percentages have varied little over the last 3 quarters.

Of the test results shown in Figure 4, only two States include results for histopathology or multiple tests. Georgia reported four out of four positive for quarter one 1994 and three out of three positive for quarter four 1993. Minnesota reported three out of three positive for quarter one 1994. The remaining test results shown in Figure 4 and all results shown in Figures 2 and 3 were for AGID.

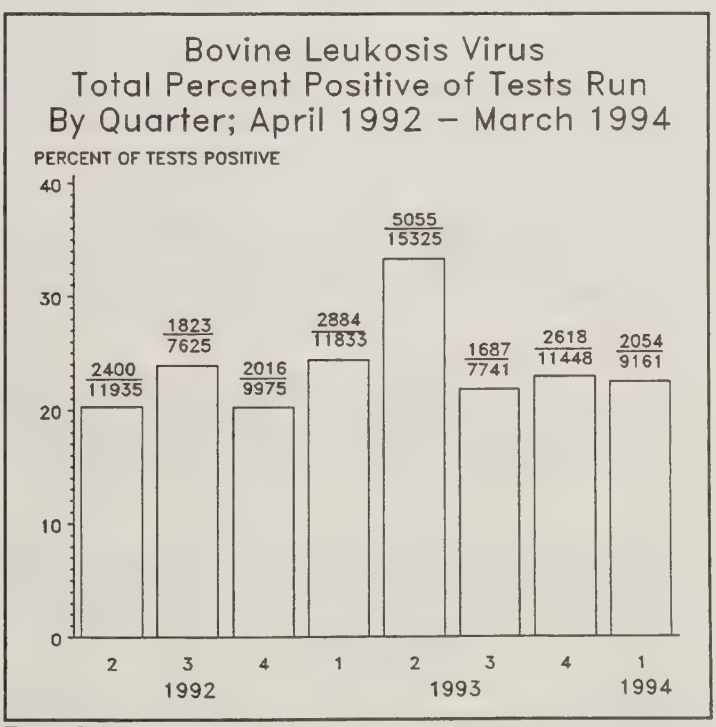


Figure 5

☐ Paratuberculosis

Criteria: Culture, histopathology, DNA probe, AGID, ELISA, or CF.

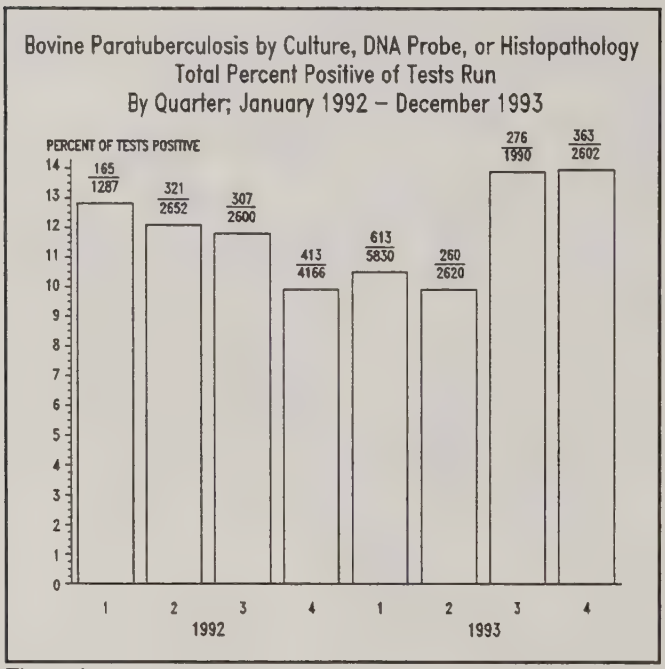


Figure 6

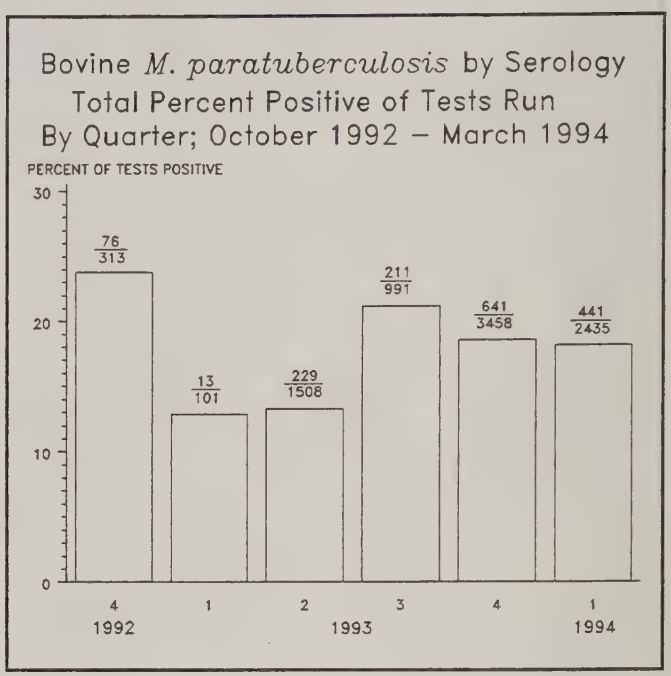


Figure 7

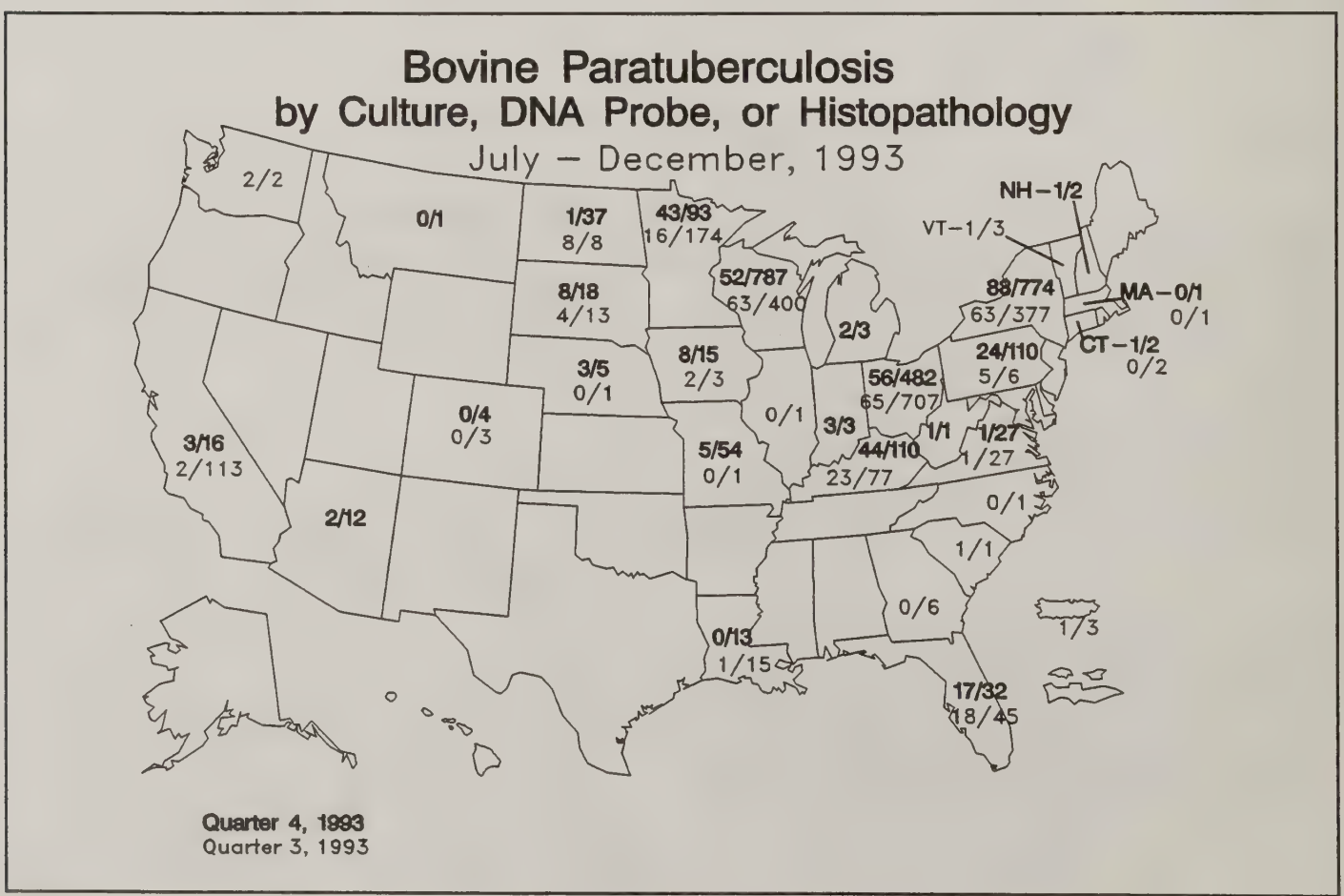


Figure 8

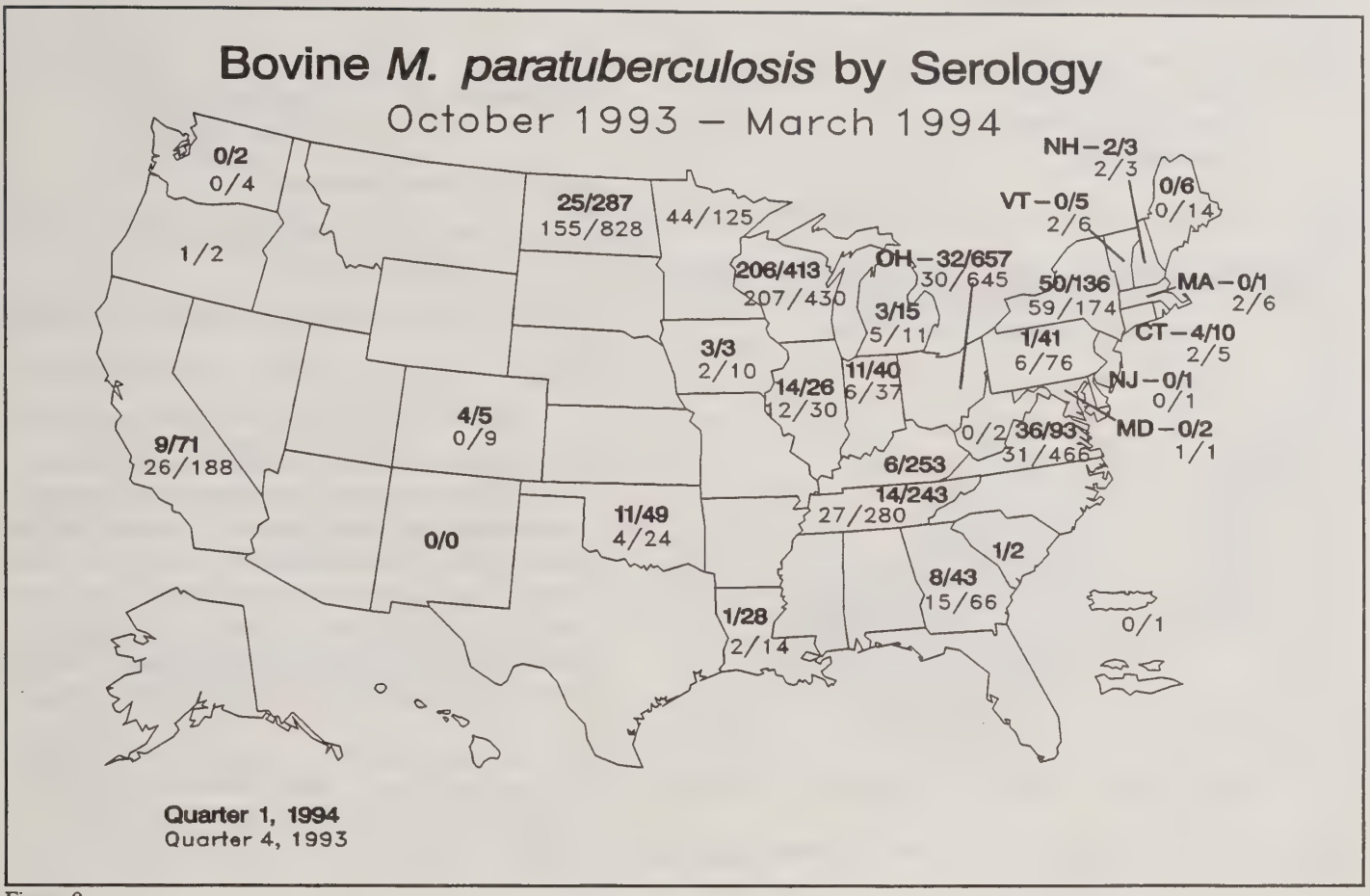


Figure 9

Bovine: The apparent increase in percent positive for culture, DNA probe, and histopathology for the third and fourth quarters of 1993 may be due to reporting on this disease by four additional laboratories. Positives for the fourth quarter of 1994 were 363/2,602, 14.0 percent (Figure 6). Percent positive for bovine serology remained steady for the first quarter of 1994 with 441/2,435, 18.1 percent (Figure 7).

Figure 8 shows the culture, DNA probe, and histopathology results for bovine paratuberculosis for the third and fourth quarters of 1993 by State. Figure 9 shows the serology results for bovine paratuberculosis for the first quarter of 1994 and the fourth quarter of 1993 by State.

Caprine: For the fourth quarter of 1993, one out of 19 caprine paratuberculosis culture, DNA probe, and histopathology tests were positive (5.3 percent). Tests were conducted on specimens from California (1 positive out of 5), New York (0/10), Ohio (0/3), and Wisconsin (0/1). For the first quarter of 1994, 37 out of 548 (6.8 percent) caprine serology tests were positive.

Ovine: For the fourth quarter of 1993, zero out of eight ovine paratuberculosis culture, DNA probe, and histopathology tests were positive. Tests were conducted on specimens from California (1), Maine (1), New York (1), Ohio (1), Oklahoma (2) and Vermont (2). For the first quarter of 1994, one out of 15 ovine serology tests were positive (6.7 percent). Ohio reported the positive result.

Other: Culture results for nontraditional species were reported for the fourth quarter of 1993. Zero out of six tests on zoo ruminants (Florida) were positive. Additional negative tests reported were for cervidae: Minnesota (1), New Jersey (2), New York (3), Ohio (1), and Wisconsin (4).

☐ Bovine Brucellosis

Source: Dr. Mike Gilsdorf
USDA:APHIS:VS
Cattle Diseases Staff
(301) 436-4918

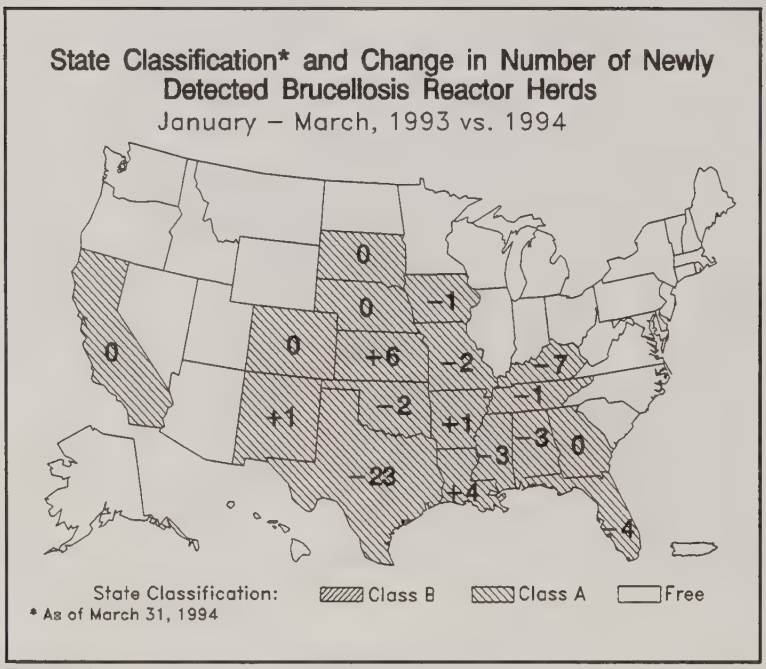


Figure 10

Reactor herd = Herd with at least one case of brucellosis confirmed by serology or culture.

Definition of State Classifications:

Class B: More than 0.25 percent, but less than 1.5 percent of all herds infected.

Class A: No more than 0.25 percent of all herds infected.

Free: No infected herds under quarantine during the past 12 months.

From January 1 through March 31, 1994, there were no State classification changes for bovine brucellosis. Arkansas, Kansas, Louisiana, and New Mexico had increased numbers of newly detected herds. Kansas increased by six herds. Nine states had decreased numbers (Figure 10). Kentucky, Mississippi, and Texas have steadily decreased for four quarters compared to the previous year.

For the entire U.S., there were 63 newly detected reactor herds from January through March 1994 (Figure 11), 10 fewer herds than were newly identified from October through December 1993.

The 63 brucellosis reactor herds detected in the first quarter of 1994 were 34 fewer than the 97 detected during the same quarter of 1993 (Figure 12).

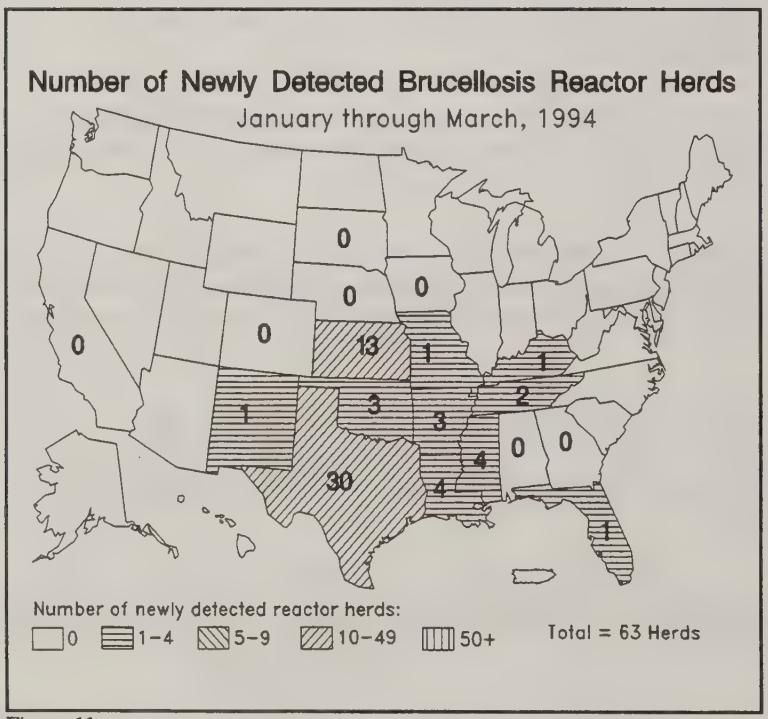


Figure 11

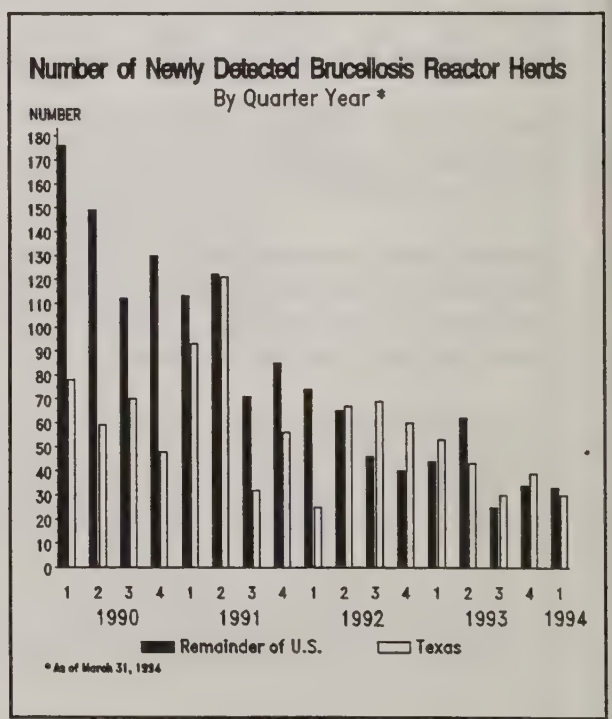


Figure 12

☐ Bovine Tuberculosis

Source: Dr. J.S. VanTiem
USDA:APHIS:VS
Cattle Diseases Staff
(301) 436-8715

Infected = Laboratory confirmed existence of *Mycobacterium bovis*.

Exposed = Animals directly associated with infected animals.

State Classifications:

Modified Accredited: Testing and Slaughter Surveillance programs in effect.

Accredited Free: Testing and Slaughter Surveillance programs have identified no infected bovines for five or more years.

No changes in the number of cattle or bison herds with bovine tuberculosis or in State classifications were reported the first quarter of 1994 (Figure 13).

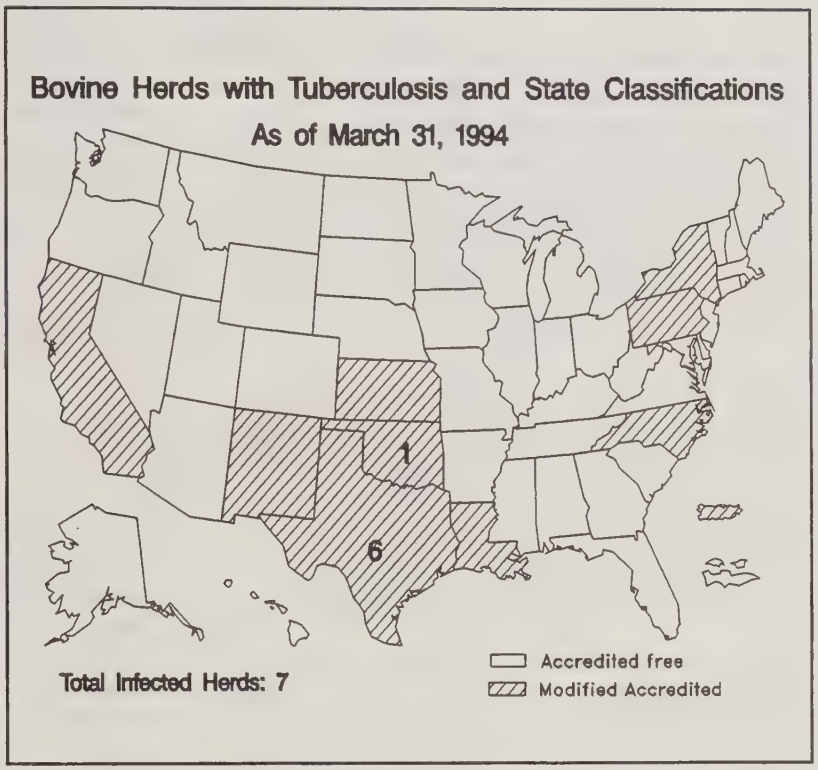


Figure 13

Colorado and Vermont each reported a newly detected herd of cervidae as being infected or exposed to bovine tuberculosis. No changes were reported in the other States for the first quarter of 1994 (Figure 14).

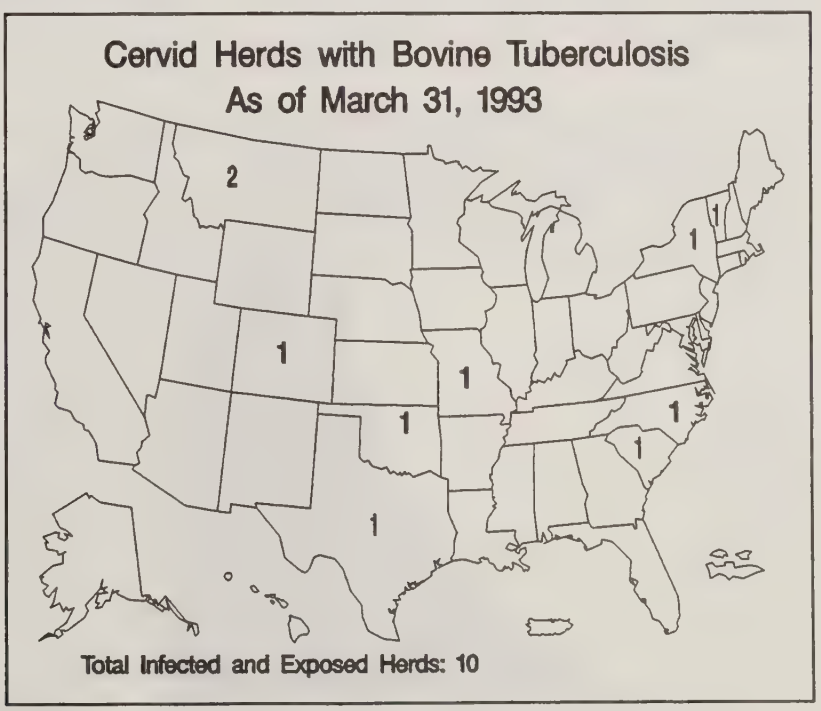


Figure 14

☐ Bovine Spongiform Encephalopathy (BSE)

Sources: Dr. G.O.Denny, Northern Ireland
Dr. A. Doherty, Republic of Ireland
Dr. B. Hornlimann, Switzerland
Dr. J. Wilesmith, Great Britain

Between March 4 and June 3, 1994, Great Britain had 7,335 newly confirmed cases of BSE with 961 more herds affected. About 51.2 percent (up from 49.3 in the previous quarter) of the dairy herds and 13.3 percent (up from 12.5) of the beef suckler herds in Great Britain have been affected (Table 4). The incidence of newly identified cases of BSE in Great Britain continues to decrease (Figure 15).

In the last 3 months, 99 additional confirmed cases of BSE have been reported from Northern Ireland, while the Republic of Ireland and Switzerland have had four and fourteen cases respectively. Germany identified one case in an imported animal. France's three new cases were in native animals (Table 5).

A total of 1,622 U.S. bovine brain specimens had been examined for BSE as of June 2, 1994. To date, the CDC has examined 163, NVSL has examined 942, and various other veterinary diagnostic laboratories have examined 476. No evidence of BSE has been found in any U.S. cattle (Figure 16).

Bovine Spongiform Encephalopathy
Descriptive Epidemiological Statistics for Great Britain*
As of June 3, 1994

Total number of confirmed cases:	128,601
Total number of affected herds:	30,620
Proportion of dairy herds affected:	51.2%
Proportion of beef suckler herds affected:	13.3%

* England, Scotland, and Wales

Table 4

Other Countries Affected by BSE

Country	Imported Cases	Native Cattle	No. of Cases	Date of Last Report
Northern Ireland	Yes	Yes	1317	1 Jun 94
Republic of Ireland	Yes	Yes	90	1 Jun 94
Switzerland	No	Yes	78	1 Jun 94
France	No	Yes	9	26 May 94
Germany	Yes	No	2	3 June 94
Canada	Yes	No	1	15 Dec 93
Portugal	Yes	No	1	5 Nov 93
Oman	Yes	No	2	31 Jul 92
Denmark	Yes	No	1	10 Aug 92
Falkland Islands	Yes	No	1	4 Sep 92

Table 5

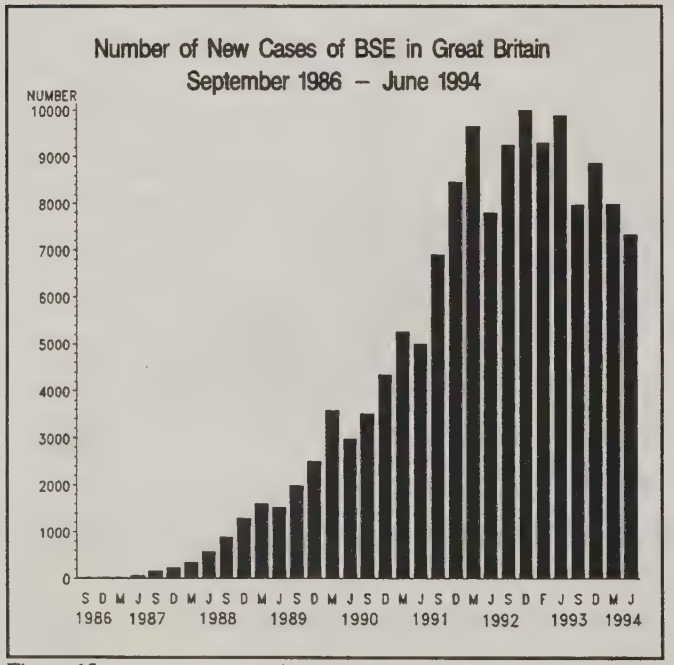


Figure 15

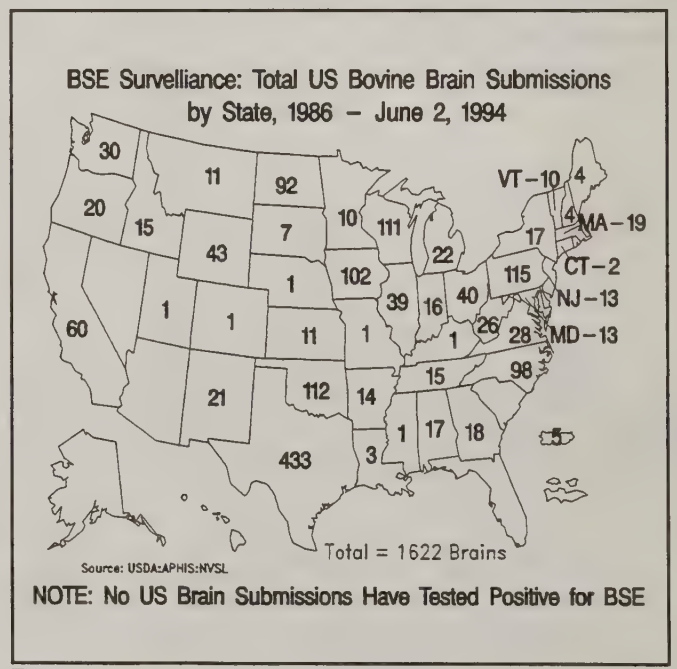


Figure 16

☐ Equine Viral Arteritis

Criteria: Virus neutralization (>1:4 titer) and no history of vaccination, or virus isolation from tissue or semen.

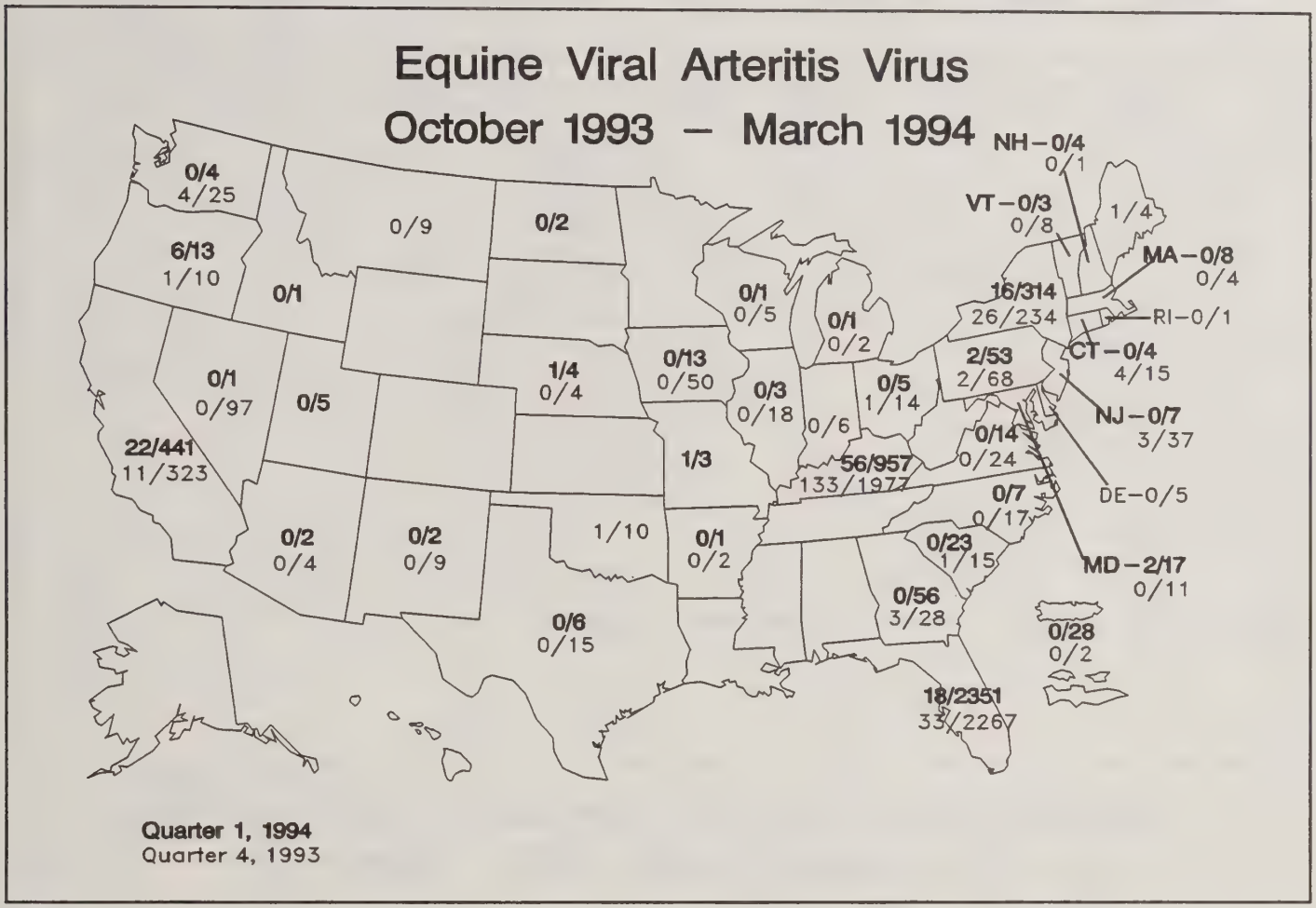


Figure 17

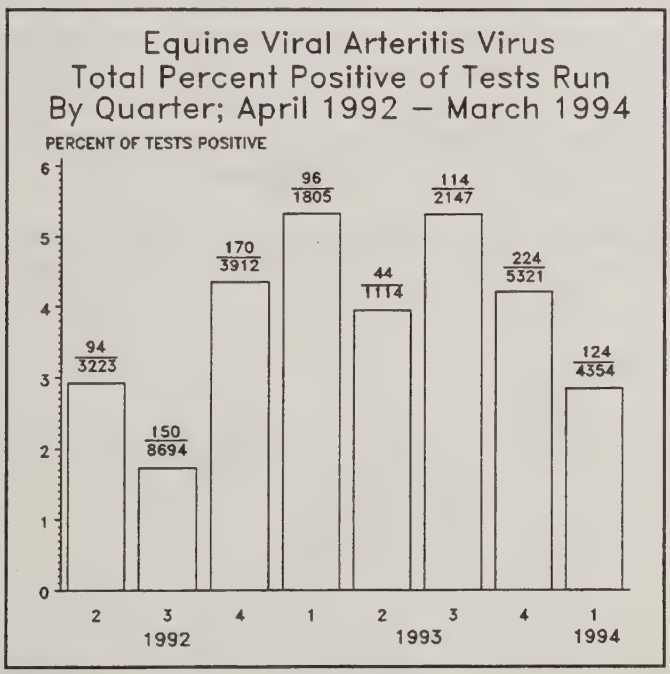


Figure 18

For all regions combined, 124 positive tests (2.9 percent of the 4,354 tests) for equine viral arteritis were reported for the first quarter of 1994 (Figure 17). This is a decrease in percent positive from quarter four (224 out of 5,321, 4.2 percent) and quarter three, 1993 (114 out of 2,147, 5.3 percent; Figure 18).

☐ Porcine Reproductive and Respiratory Syndrome (PRRS)

Criteria: Virus isolation or antibody detection by indirect fluorescent antibody.

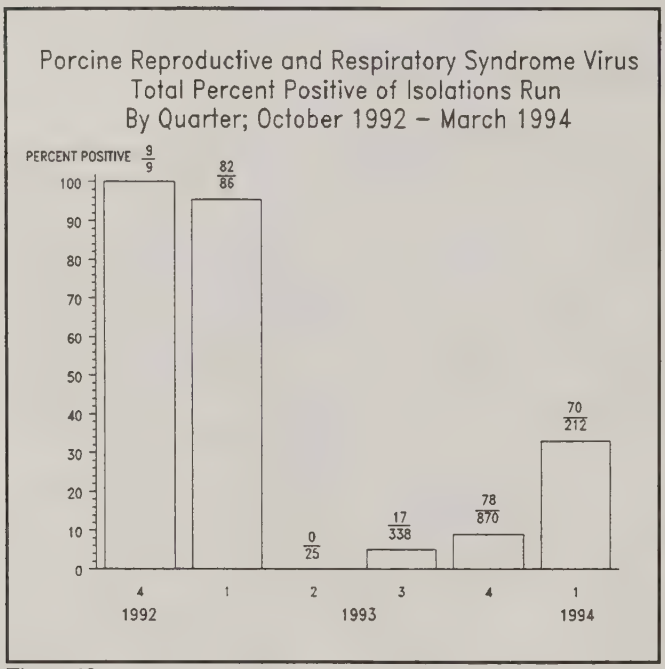


Figure 19

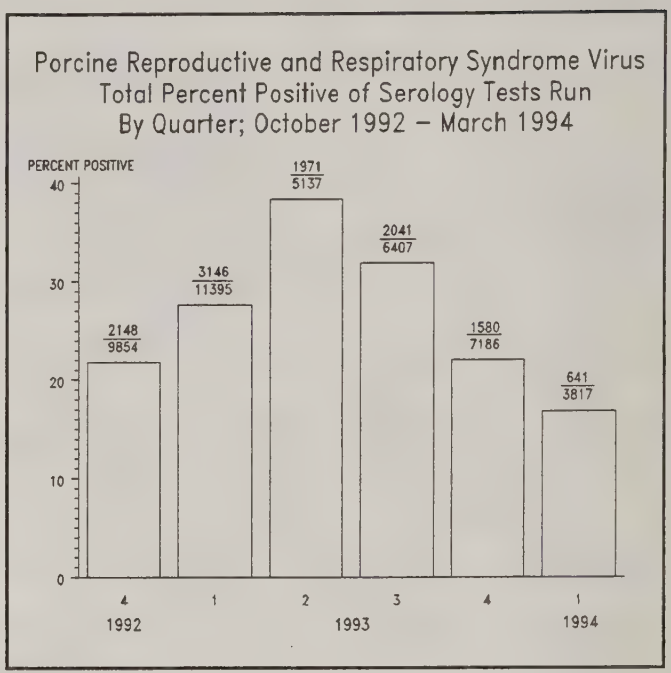


Figure 20

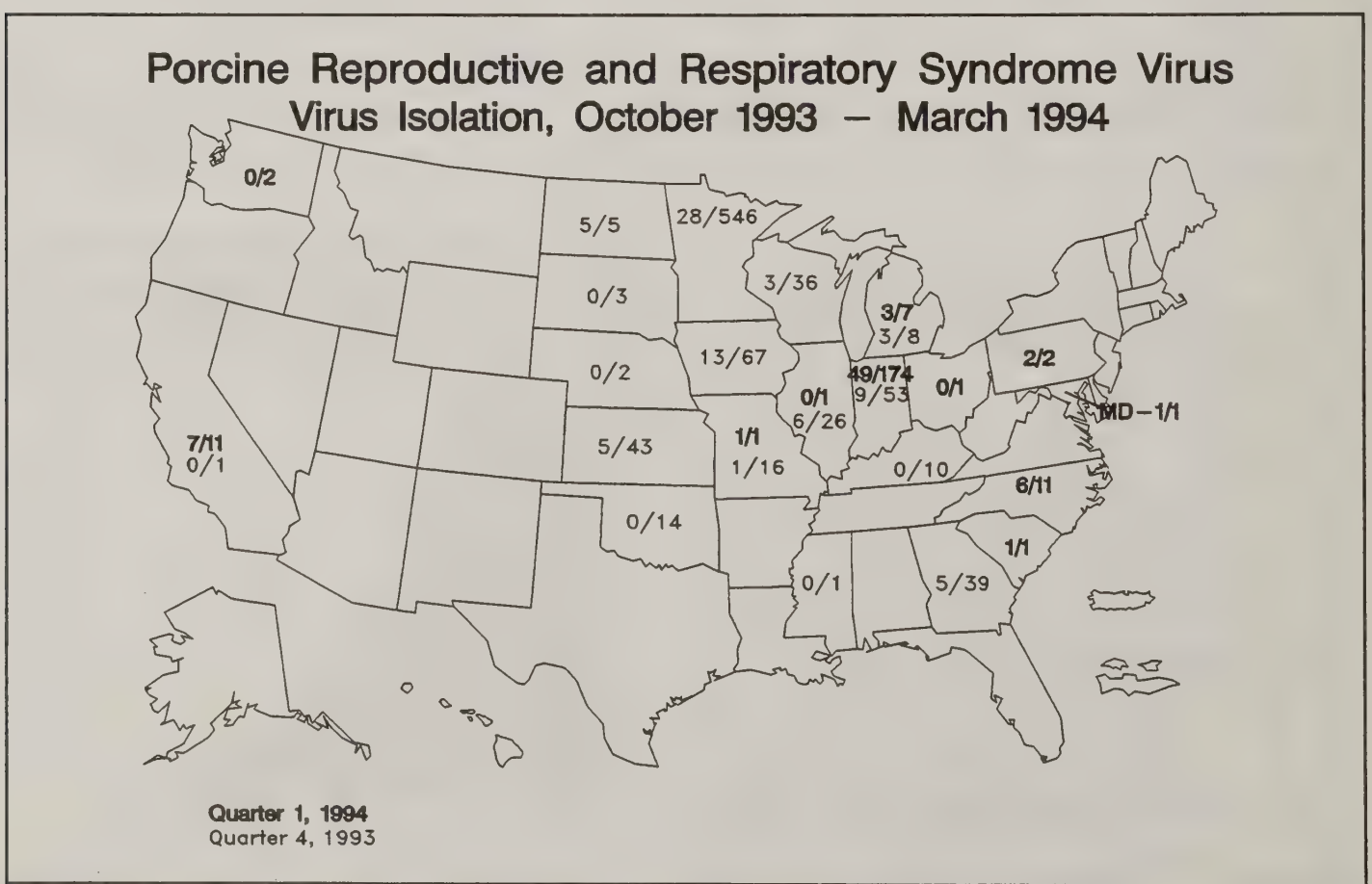


Figure 21

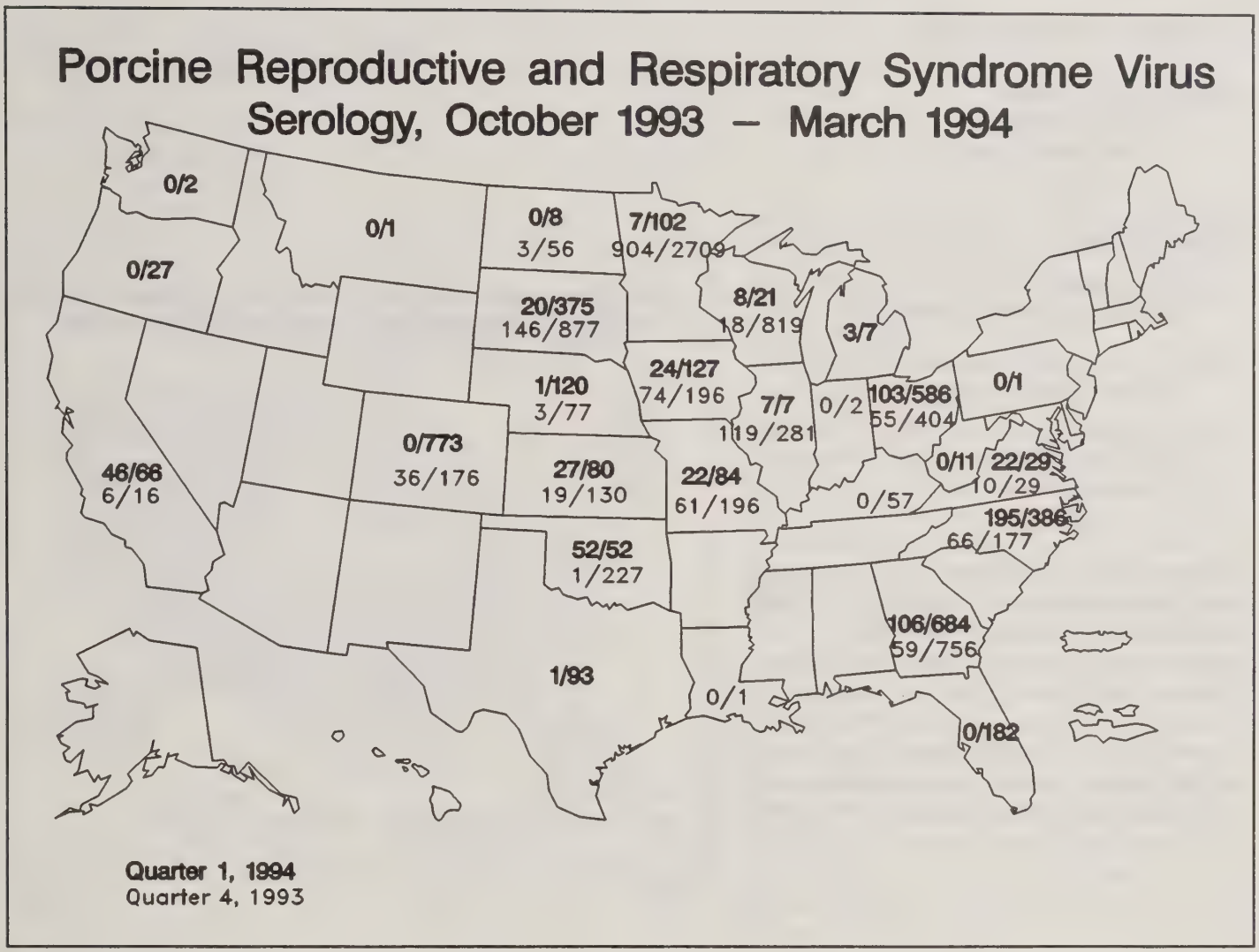


Figure 22

Positives for virus isolation were 70/212 (33.0 percent) and 78/870 (9.0 percent) for the first quarter of 1994 and the fourth quarter of 1993, respectively (Figure 19). The wide variation in percent positives for isolation may be a reflection of changes in the reporting capabilities of some laboratories. Positives for IFA tests were 641/3,817 (16.8 percent) and 1,580/7,186 (22.0 percent) for the first quarter of 1994 and the fourth quarter of 1993, respectively (Figure 20). The apparent decrease in PRRS may reflect fewer samples tested by the National Veterinary Services Laboratories and the fact that Minnesota, which does a large amount of PRRS testing, does not yet have data available for the first quarter of 1994.

Figures 21 and 22 show the results of virus isolation and FA, respectively, by State for the first quarter of 1994 and the fourth quarter of 1993.

☐ Swine Brucellosis

Source: Dr. Joe Annelli
USDA:APHIS:VS
Swine Health Staff
(301) 436-7767

State Classifications:

Stage 1: Organization
(Surveillance and traceback begun.)

Stage 2: ≥ 10 percent Surveillance/year. ≥ 80 percent of tracebacks successful.

Stage 3: Validated Free
(≥ 5 percent Surveillance/year. ≥ 80 percent of tracebacks successful.

No State classifications changes were reported from October through December 1993. Only four States had newly detected swine brucellosis reactor herds (Florida, Mississippi, Oklahoma, and Texas) during the fourth quarter of 1993 (Figure 23). The total number of newly detected herds decreased from 12 in the third quarter to seven in the fourth quarter of 1993. Mississippi detected their first reactor herd since 1990.

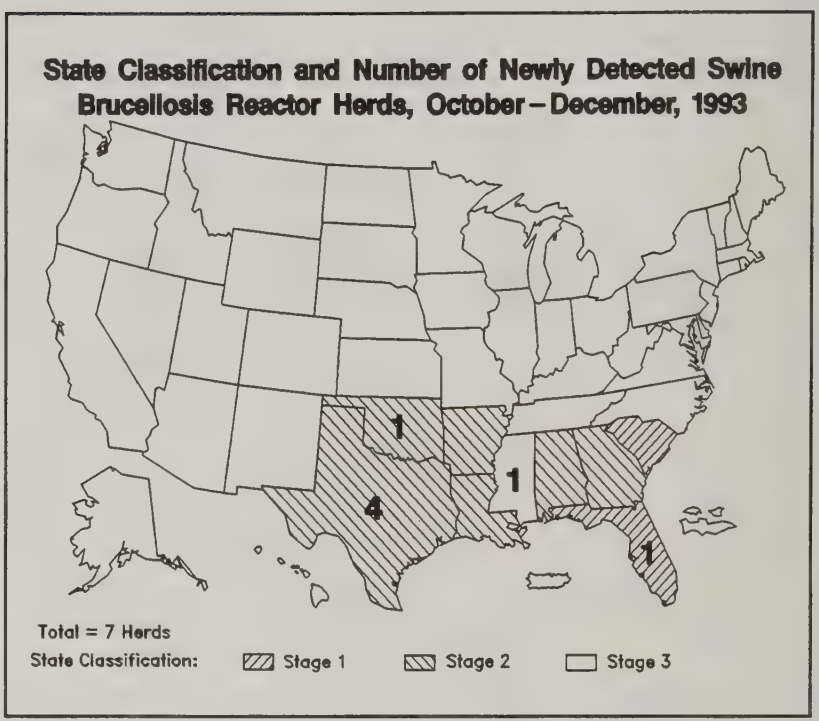


Figure 23

There were 34 quarantined herds as of December 31, 1993 (Figure 24). The total number of quarantined herds has decreased steadily since the second quarter of 1991 (77 quarantined herds). The number of quarantined herds in Georgia decreased from four to zero.

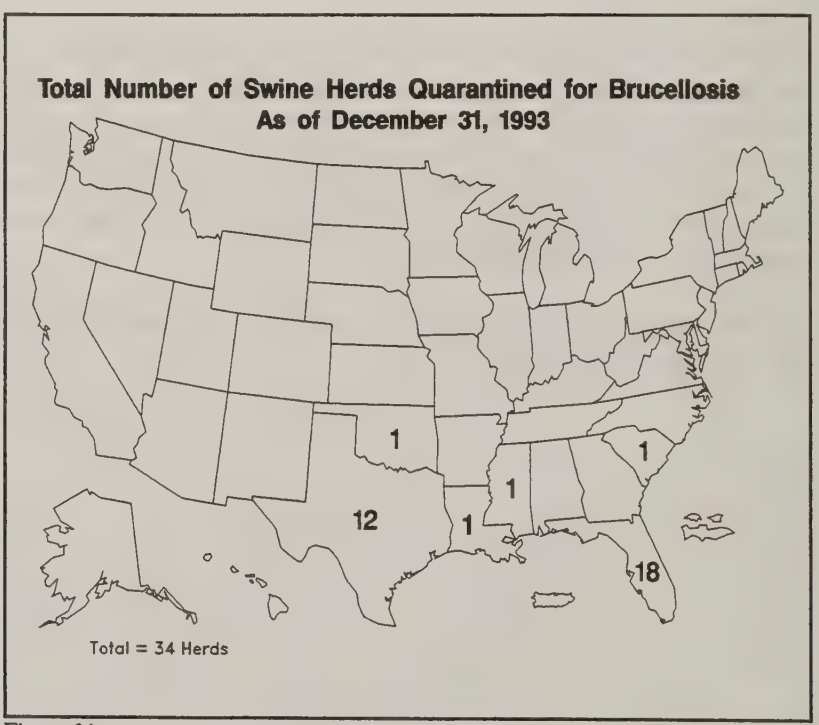


Figure 24

☐ Pseudorabies Virus (PRV)

Source: Dr. Joe Annelli
USDA:APHIS:VS
Swine Health Staff
(301) 436-7767

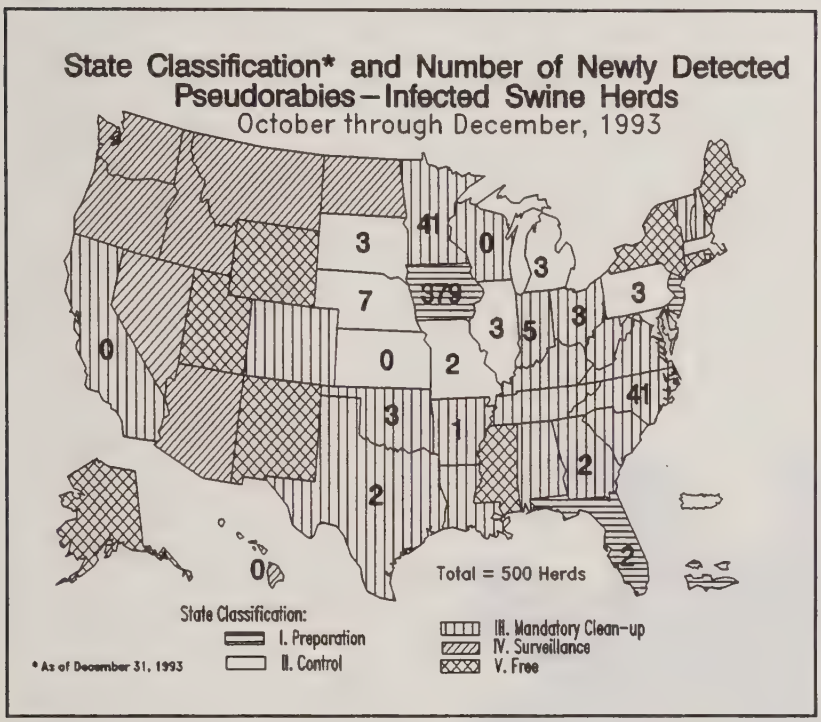


Figure 25

A total of 500 swine herds were identified with PRV during the fourth quarter of 1993 (Figure 25). The number of herds in Iowa increased from 320 in the third quarter to 379 in the fourth quarter.

Iowa had 61.8 percent of all known PRV infected swine herds in the United States (4,144 out of 6,705) in the fourth quarter of 1993. The total number of known infected herds in the U.S. has decreased by 14.5 percent over the last year, from 7,841 in the fourth quarter of 1992, to 6,705 in the fourth quarter of 1993 (Figure 26). The total number of known infected herds in States other than Iowa decreased during the same period from 3,343 to 2,561.

The swine herd clean-up rate (percent of known infected herds in clean-up programs) has steadily increased for all States since 1990 (Figure 27). For the fourth quarter of 1993, the overall clean-up rate was 92 percent, with 6,148 of the 6,705 known infected herds on clean-up plans.

State classification changes for the fourth quarter of 1993 included Maryland and Puerto Rico (Class II); California and Vermont (Class III); Washington (Class IV); Mississippi, New Mexico, and Wyoming (Class V).

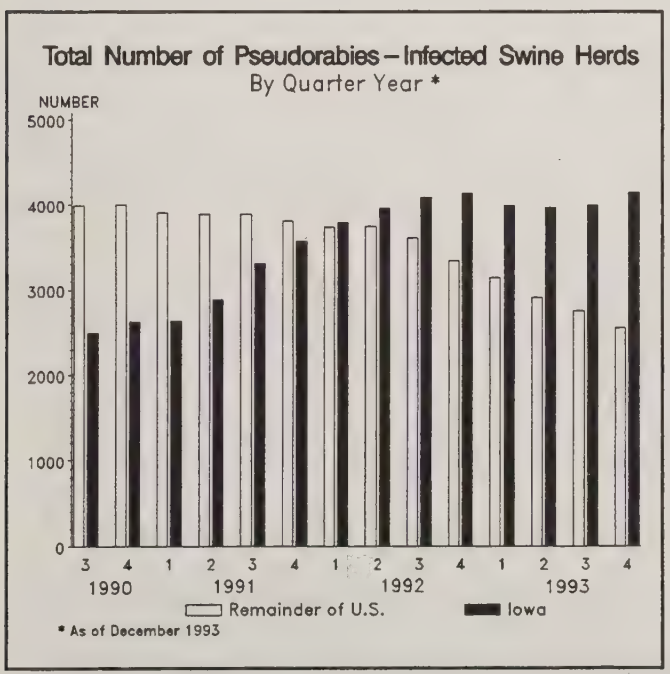


Figure 26

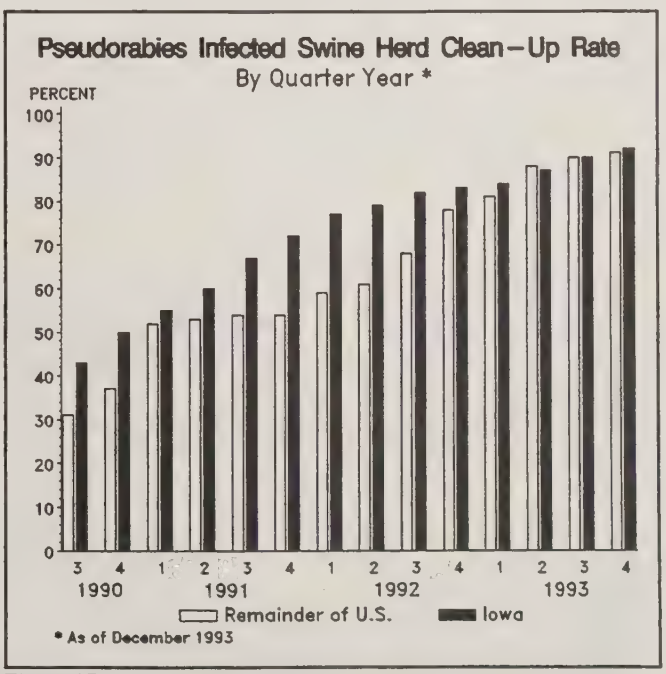


Figure 27

II. Etiologic Agents Associated with Bovine Abortion

Section II characterizes selected agents associated with bovine abortions (aborted fetuses or congenitally infected calves) from accessions reported to veterinary diagnostic laboratories.

Key to Figures in this Section:

- **The percents positive presented here are the number of positive accessions out of the total number of accessions tested and should not be interpreted as disease prevalence or incidence rates.**
- **In some cases, the denominator is a minimum because some laboratories were not able to determine the total number of negative tests performed.**
- **Data are presented by region or State of specimen origin and quarter year of specimen submission.**
- **See map on inside back cover for regions.**

☐ *Neospora* spp.

Criteria: Histopathology and detection of antigen by immunohistochemistry, or detection of antibody in aborted fetus by indirect FA.

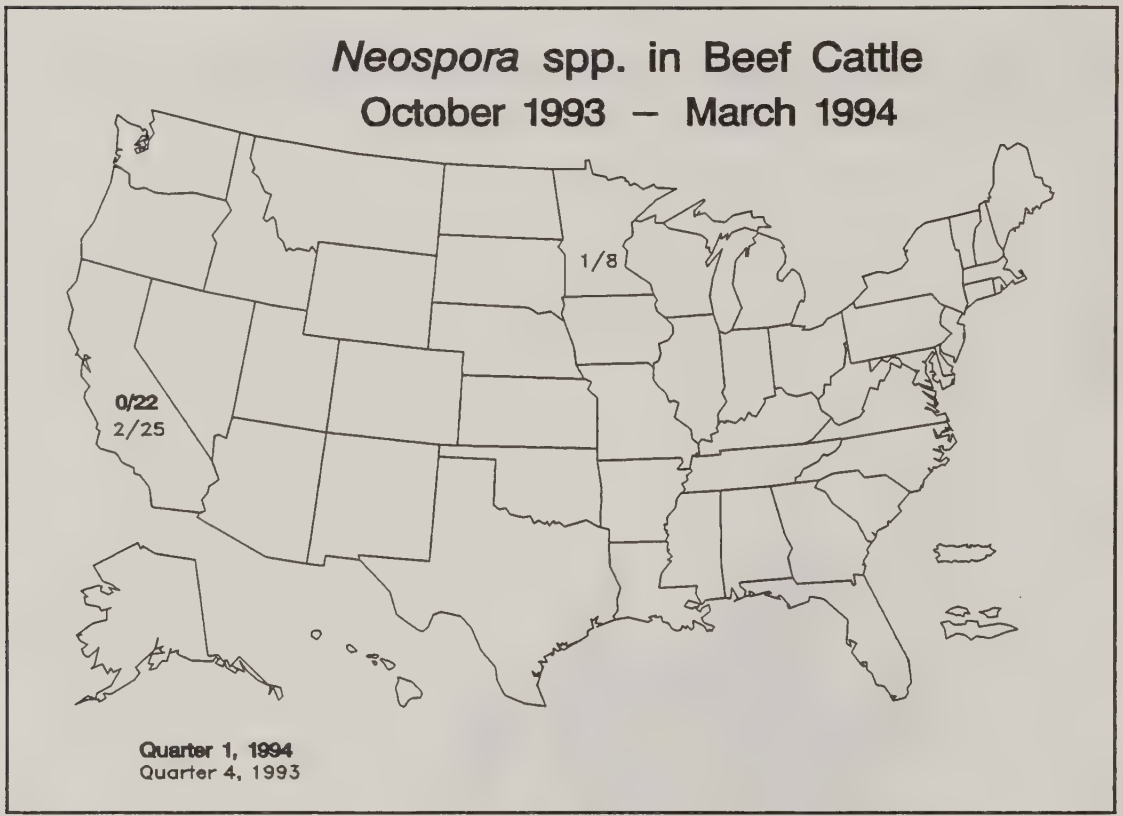


Figure 28

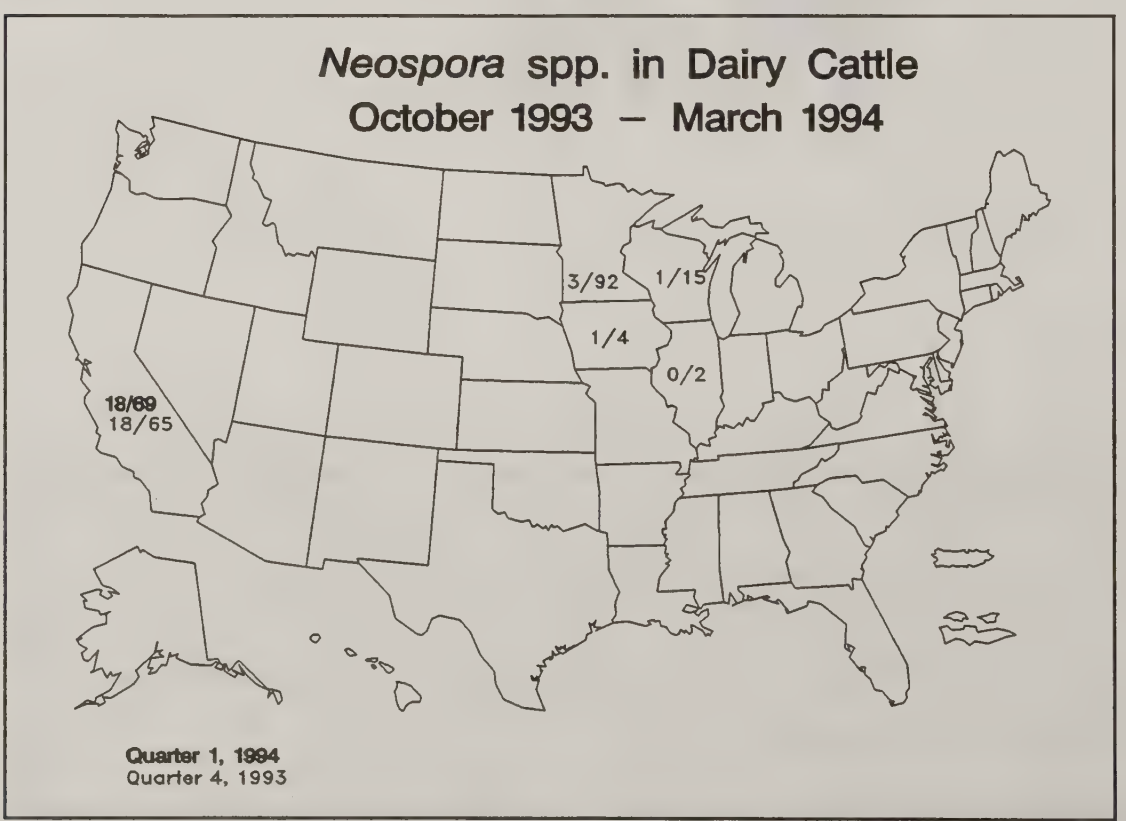


Figure 29

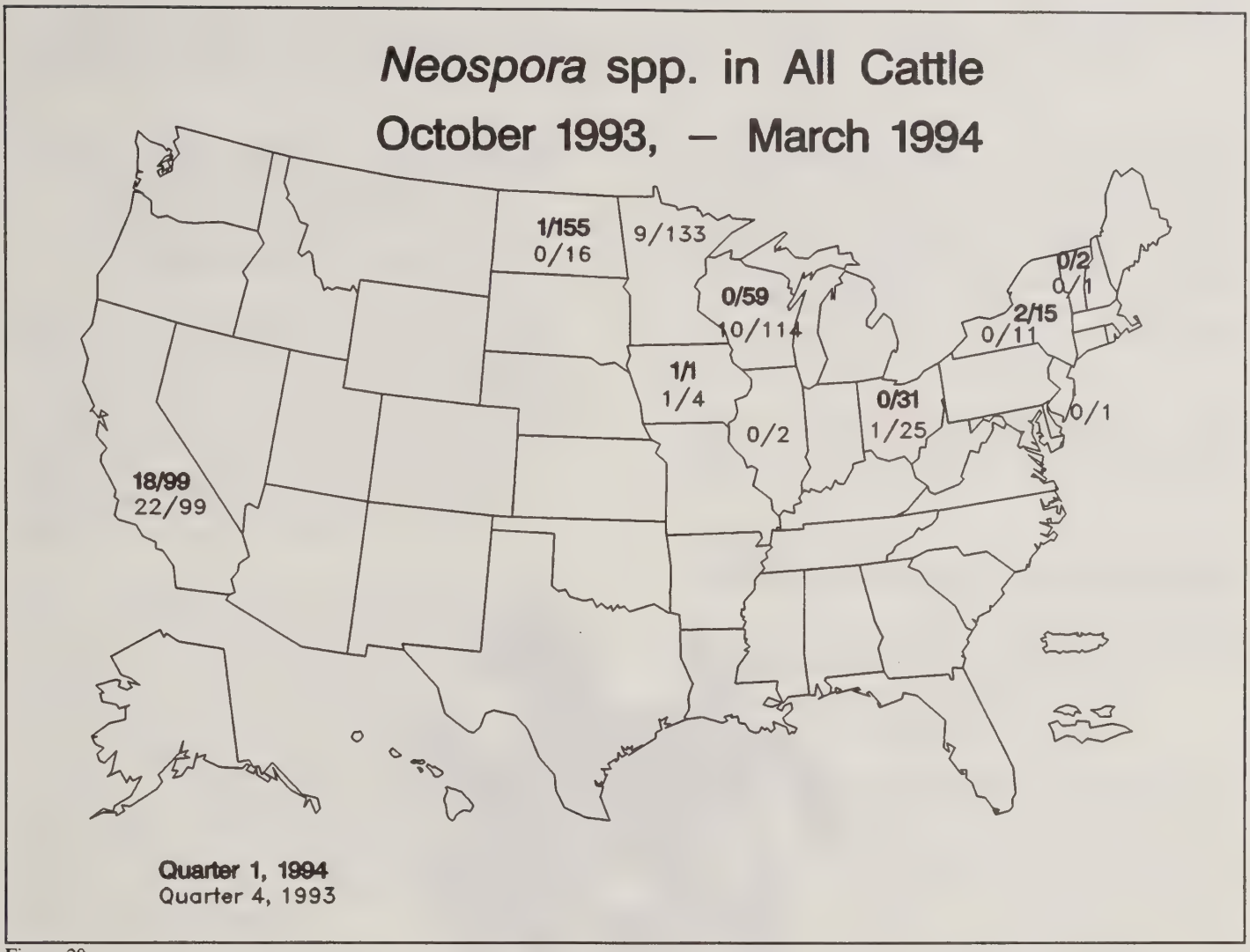


Figure 30

Figures 28 through 30 show the distribution of test results for *Neospora* spp. for the fourth quarter of 1993 and the first quarter of 1994 by State. Figure 30 includes results where the class was unknown. For all cattle, 22/362 (6.1 percent) accessions tested positive for *Neospora* spp. during the first quarter of 1994, compared to 43/406 (10.6 percent) and 24/291 (8.3 percent) for the fourth quarter of 1993 and the first quarter of 1993, respectively (Figure 31). California accounted for 18 of the 22 accessions reported positive during the first quarter of 1994.

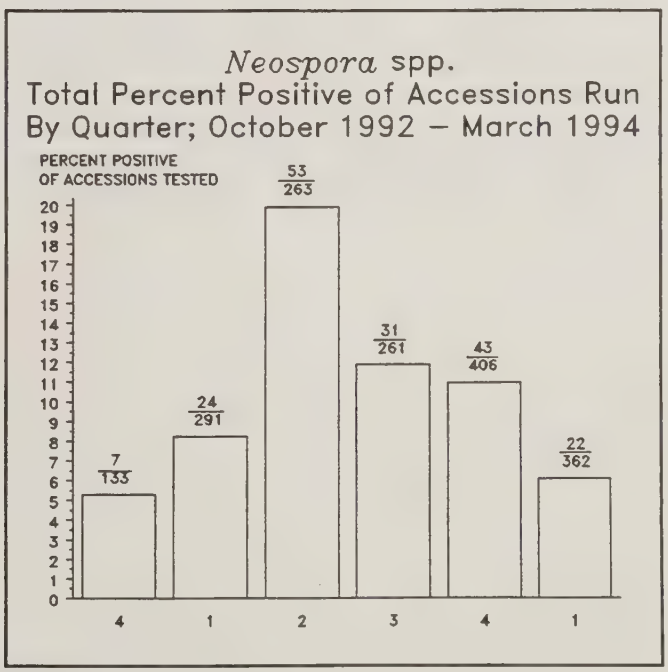


Figure 31

DxNEWS

This section contains news items and articles of potential interest to diagnostic laboratories. Submissions from nonparticipating laboratories are welcome.

Cattle Tagged Suspect on Antemortem Inspection More Likely to be Market Cattle Inspection (MCI) Reactors or Suspects

USDA:APHIS:VS field Veterinary Medical Officers (VMO's) in North Dakota proposed the hypothesis that brucellosis MCI reactors are often visually infirm at slaughter and are often the only animal(s) in a lot to be slaughtered as a Food Safety and Inspection Service (FSIS) "suspect" and/or condemned. A retrospective study using MCI computer data was conducted to test this hypothesis.

Cows are identified in the MCI data base as "suspect" when a blood sample from the slaughter plant arrives at the laboratory with an FSIS "suspect" tag in the bag. The FSIS "suspect" tag indicates the animal was identified as "suspect" for slaughter because of abnormal findings during the antemortem inspection. Animals are identified as "suspect" for a number of conditions, including broken legs, cachexia, lymphomatosis, leukosis, mastitis, hardware disease, foot rot, chronic suppurative pneumonia, Johne's disease, pinkeye, cancer eye, actinomycosis, actinobacillosis, and others.

The study included data from October 1, 1991, through January 19, 1994. Slaughtered cows were categorized as MCI "negative," MCI "reactor," FSIS "suspect," and FSIS not "suspect." The resulting 2x2 table is shown in Table 6.

Table 6.

	North Dakota MCI Titer Oct 1, 1991 - Jan 19, 1994		
FSIS		Positive	Negative	Total
Antemortem	Yes	7	6594	6601
"Suspect"	No	92	252,176	252,268
	Total	99	258,770	258,869
	OR = 2.9		χ^2 = 8.15, 1 df	

These data support the conclusion that a cow visually identified by antemortem inspection as an FSIS "suspect" is about 2.9 times as likely to be an MCI "reactor" as a cow not identified as "suspect."

This study is applicable only to animals slaughtered in and traceable to North Dakota. The findings make the history of the individual MCI reactor more significant in the light of its concurrent illness. An epidemiologist with knowledge that there is an FSIS "suspect" effect could factor this into his/her judgement with regard to classifying MCI cases and the need for follow-up brucellosis testing.

Contact: Dr. Irwin Huff, Area Veterinarian in Charge, USDA:APHIS:VS, Bismark, North Dakota, (701) 250-4210.

Free Data Submission Software Available

The DxMONITOR Data Submission System (DDSS) is available free of charge to any laboratory interested in participating in the Veterinary Diagnostic Laboratory Reporting System (VDLRS).

To use the DDSS, data must first be captured by a laboratory in whatever manner works best for that particular laboratory. The summary totals of those data are then entered into a data entry screen which is provided as part of the DDSS. A computer file is automatically created for use in transferring the data. A reference guide leads the user through this process. Because the system was written within a software package called "Epi Info," a copy of this program and a user's guide are also included. Epi Info was developed by the Centers for Disease Control and the World Health Organization. It has many capabilities including data analysis, word processing, statistics, etc. Please contact the address on the inside front cover of this issue for more information about the DDSS.

Materials available from the VDLRS are listed below. Send this clip-out order form to:

Veterinary Diagnostic Laboratory
Reporting System
USDA:APHIS:VS
555 South Howes, Suite 200
Fort Collins, CO 80521-2586

Quantity

_____ **DxMONITOR Animal Health Report***
(Quarterly report of VDLRS data)

_____ **Introduction to the VDLRS**
(An informational brochure)

_____ **Report of the 1991 DxMONITOR Committee Meeting** (August 1991)

* The most recent issue of the DxMONITOR will be sent. If you want past issues, please call (303) 490-7800.

Name:_____

Affiliation:_____

Street:_____

City/State:_____ ZIP:_____

☐ Please add my name to the mailing list for the DxMONITOR Animal Health Report.

Lab Notes and DxNEWS Article Submissions are Encouraged

Readers of the DxMONITOR Animal Health Report are encouraged to submit items suitable for the "Lab Notes" and the "DxNEWS." All articles should be typed double spaced. Photos/artwork should be camera ready copy. If possible, please provide your article on diskette and indicate what type of software was used to create/store the file (i.e., WordPerfect, Word Star). Send submissions to the address on the inside front cover of this issue.

Appendix

This section provides tables displaying the most recently reported diagnostic laboratory data.

Key to Tables in this Section:

- Data are presented by laboratory of specimen origin and quarter of specimen submission. Because individuals within a State may utilize outside laboratories in addition to their own, the State numbers presented in the State maps may not agree with the numbers presented by reporting laboratory in the appendix.
- Values represent the number of positive tests or accessions (P) and the number of tests performed or accessions tested (T).
- Values reported in the "TOT" category represent all tests performed during the quarter This category may include some tests for which a month of specimen submission was not known. Therefore, the sum of the quarterly values may not be equal to the "TOT" values.
- Data totals (positives and total tests) shown for "All Calves" include specimens of unknown bovine class and those from veal calves, in addition to specimens from beef or dairy calves. Thus, the sums of dairy calf totals and beef calf totals do not always equal the totals shown for all calves.
- Values reported for all diagnoses/agents are for quarters in 1992 and 1993.
- In some cases, the reported total number of tests performed is a minimum because some laboratories were not able to determine the total number of negative tests performed.
- Abbreviations for laboratories used in the tables are:

ARVDL = Arkansas	CAVDL = California	FLVDL = Florida	GAATH = GA, Athens
GATFT = GA, Tifton	IAVDL = Iowa	INVDL = Indiana	KYMSU = KY, Hopkinsville
KYVDL = KY, Lexington	MNDVL = Minnesota	MOVDL = Missouri	NDVDL = North Dakota
NEVDL = Nebraska	NMVDL = New Mexico	NVSL = National	NYVDL = New York
OHVDL = Ohio	OKVDL = Oklahoma	ORVDL = Oregon	PAVL = TX, Austin
PRVDL = Puerto Rico	SCVDL = South Carolina	SDVDL = South Dakota	TNVDL = Tennessee
TXVDL - TX, College Station	VAVDL = Virginia	WIVDL = Wisconsin	WYVDL = Wyoming

Appendix

Bovine Leukosis Virus

Lab		Beef Quarter 2/93	Beef Quarter 3/93	Beef Quarter 4/93	Beef Quarter 1/94	Beef TOT	Dairy Quarter 2/93	Dairy Quarter 3/93	Dairy Quarter 4/93	Dairy Quarter 1/94	Dairy TOT	Total Quarter 2/93	Total Quarter 3/93	Total Quarter 4/93	Total Quarter 1/94	Total TOT
ARVDL	P	22	35			57	7	17			24	36	77			113
	T	42	82			124	14	28			42	91	168			259
CAVDL	P			2	21	23			175	114	289	130	117	178	144	569
	T			32	43	75			626	546	1172	438	342	667	609	2056
FLVDL	P	6	30	9	0	45	27	27	133	14	201	33	57	142	14	246
	T	33	719	153	39	944	41	52	274	23	389	74	771	426	62	1333
GAATH	P											70	14	15	44	143
	T											119	45	32	74	270
GATFT	P											3092	74	43	119	3328
	T											5100	158	105	264	5627
INVDL	P			20	17	37				19	19			20	36	56
	T			41	37	78				38	38			41	75	116
KYMSU	P											21	62	78	77	238
	T											200	144	188	197	729
KYVDL	P			37	12	49			107	19	126			150	34	184
	T			237	70	307			287	38	325			538	141	679
MNVDL	P											119	109	115		343
	T											407	303	362		1072
MOVDL	P											10	20	22	45	97
	T											275	250	44	68	637
NDVDL	P											51	58	13	44	166
	T											242	147	49	133	571
NMVDL	P			0		0		2	0		2		2	0	0	2
	T			0		0		3	0		3		3	0	0	3
NVSL	P											19	0	0	0	19
	T											254	8	33	6	301
NYVDL	P											514	391	842	351	2098
	T											4638	2302	4601	2276	13817
OHVDL	P											468	359	280	626	1733
	T											1848	1311	1584	3217	7960
OKVDL	P	10	59	42	25	136	3	24	24	15	66	13	87	82	91	273
	T	37	137	85	69	328	3	38	29	25	95	40	197	142	258	637
PRVDL	P											2				2
	T											20				20
SDVDL	P														223	223
	T														852	852
TNVDL	P												91	277	140	273
	T												167	525	331	1023
TXVDL	P											343	128	322	37	830
	T											1125	1232	1888	530	4775
VAVDL	P	104	31	13	27	175	22	10	26	2	60	134	41	39	29	243
	T	370	153	123	60	706	58	40	100	8	206	454	193	223	68	938

Paratuberculosis by Culture, Histopathology, or DNA Probe

		Bovine					Ovine					Caprine				
		|---- Quarter ---- |					|---- Quarter ---- |				|---- Quarter ---- |				
Lab		1/93	2/93	3/93	4/93	TOT	1/93	2/93	3/93	4/93	TOT	1/93	2/93	3/93	4/93	TOT
ARVDL	P	4	1			5										
	T	6	5			11										
CAVDL	P	1		2	3	6				0	0				1	1
	T	121		113	16	250				1	1				5	5
FLVDL	P	16	32	18	17	83						0		1		1
	T	48	72	45	32	197						2		2		4
GAATH	P	4				4										
	T	30				30										
GATFT	P	0		0		0										
	T	5		3		8										
INVDL	P				3	3										
	T				3	3										
KYMSU	P	7	11	16	29	63										
	T	17	45	57	82	201										
KYVDL	P			7	15	22										
	T			20	28	48										
MNVDL	P	82	12	21	56	171		0	0		0		0	1		1
	T	249	22	181	121	573		2	1		3		2	1		3
MOVDL	P	2	4		5	11										
	T	35	20		54	109										
NDVDL	P	4	1	9	1	15								1		1
	T	4	1	9	36	49								1		1
NVSL	P	3	5	6	1	15						0	0	0		0
	T	20	198	24	4	246						1	2	2		5
NYVDL	P	399	111	69	114	693	0	0	1	0	1	2	0	1	0	3
	T	4334	1562	422	924	7242	3	8	5	6	22	20	3	1	10	34
OHVDL	P	89	70	65	56	280	0	0	0	0	0	0	0	4	0	4
	T	941	661	707	481	2790	2	5	3	1	11	1	2	17	3	23
SDVDL	P	2	12	7	17	38		1	0		1					
	T	3	25	18	38	84		1	1		2					
VAVDL	P	0	1		1	2										
	T	17	9		5	31										
WIVDL	P			56	45	101									0	0
	T			391	778	1169									1	1

Appendix

M. paratuberculosis by Serology

		Bovine					Ovine					Caprine				
		|---- Quarter ---- |					|---- Quarter ---- |				|---- Quarter ---- |			
Lab		2/93	3/93	4/93	1/94	TOT	2/93	3/93	4/93	1/94	TOT	2/93	3/93	4/93	1/94	TOT
CAVDL	P	16		26	9	51	1		0	0	1	0		3	1	4
	T	144		188	71	403	4		2	4	10	5		11	3	19
GAATH	P		6	9	4	19										
	T		23	30	20	73										
GATFT	P		3	6	4	13										
	T		19	36	23	78										
INVDL	P			4	8	12								0		0
	T			30	31	61								3		3
KYMSU	P	57	45			102										
	T	119	162			281										
KYVDL	P				6	6										
	T				253	253										
MNVDL	P	82	82	60		223	1				1	0	1			1
	T	214	238	181		633	1				1	46	2			48
NDVDL	P			155	25	180										
	T			828	287	1115										
NMVDL	P				0	0										
	T				0	0										
NYVDL	P	44	18	79	57	198	1	1	11	0	13	2	0	3	16	21
	T	246	52	647	357	1302	7	4	175	4	190	37	8	136	165	346
OHVDL	P	9	21	24	31	85										
	T	302	289	631	538	1760										
OKVDL	P	0	5	4	11	20										
	T	320	54	24	49	447										
PAVL	P			6	7	13			4	1	5			24	18	42
	T			73	15	88			139	2	141			256	373	629
PRVDL	P	0				0										
	T	5				5										
TNVDL	P	8	21	25	13	67										
	T	135	120	277	240	772										
VAVDL	P	13	10	27	36	86										
	T	23	34	71	90	218										
WIVDL	P			216	230	446				0	0			3	2	5
	T			442	461	903				5	5			6	7	13

Equine Viral Arteritis

Lab		2/93	3/93	4/93	1/94	TOT
CAVDL	P	7	4	4	14	29
	T	233	260	348	380	1221
FLVDL	P	1	16	33	18	68
	T	430	540	2251	2347	5568
GAATH	P	0		3	0	3
	T	14		19	42	75
GATFT	P	0		0	0	0
	T	7		8	14	29
KYVDL	P			133	56	189
	T			1922	957	2879
NMVDL	P		0	0	0	0
	T		40	9	1	50
NVSL	P	8	43	4	8	63
	T	58	332	197	156	743
NYVDL	P	28	51	47	28	154
	T	347	938	545	443	2273
VAVDL	P	0	0	0	0	0
	T	25	37	22	14	98

Porcine Reproductive and Respiratory Syndrome Virus
Indirect Fluorescent Antibody

Lab		2/93	3/93	4/93	1/94	TOT
CAVDL	P	10	0	3	23	36
	T	30	1	8	31	70
GAATH	P			15	106	121
	T			413	684	1097
GATFT	P		12	3		15
	T		262	274		536
KYMSU	P		8			8
	T		40			40
MNVDL	P	994	839	1236		3069
	T	2529	3064	4775		10368
MOVDL	P	1	6	23	18	48
	T	5	31	40	69	145
NVSL	P	966	204	130	327	1627
	T	2573	945	603	933	5054
OHVDL	P			52	103	155
	T			396	583	979
SDVDL	P		972	118	64	1154
	T		2064	677	1517	4258

Porcine Reproductive and Respiratory Syndrome Virus
Virus Isolation

Lab		2/93	3/93	4/93	1/94	TOT
INVDL	P			13	70	83
	T			69	212	281
MNVDL	P	0	17	65		82
	T	25	338	801		1164

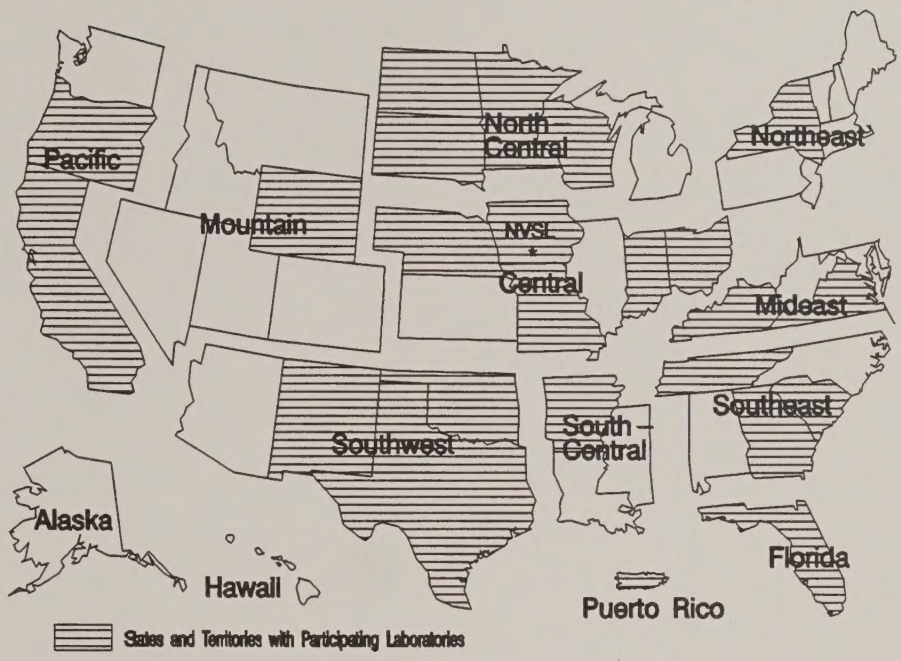
Neospora spp.

		Beef					Dairy					Total				
		|---- Quarter ---- |					|---- Quarter ---- |				|---- Quarter ---- |			
Lab		2/93	3/93	4/93	1/94	TOT	2/93	3/93	4/93	1/94	TOT	2/93	3/93	4/93	1/94	TOT
CAVDL	P	11	1	2	0	14	27	23	18	18	86	41	27	22	18	108
	T	41	33	25	22	121	70	66	65	69	270	121	116	99	99	435
KYMSU	P												0			0
	T												5			5
MNVDL	P	0	0	1		1	9	4	5		18	9	4	6		19
	T	8	4	8		20	122	106	113		341	142	116	135		393
MOVDL	P												0			0
	T												0			0
NDVDL	P											0	0	5	1	6
	T											.	24	35	155	214
NYVDL	P											2		0	2	4
	T											.		13	17	30
OHVDL	P											1		1	0	2
	T											.		25	31	56
WIVDL	P													9	1	10
	T													99	60	159

REGIONS OF THE VDLRS

Abbreviations for regions used in this issue are:

AK = Alaska
CL = Central
FL = Florida
HI = Hawaii
ME = Mideast
MN = Mountain
NC = North-Central
NE = Northeast
PA = Pacific
PR = Puerto Rico & U.S. Virgin Islands
SC = South-Central
SE = Southeast
SW = Southwest
UNK = Unknown



Contributing Laboratories

The following laboratories have contributed data reported in the DxMONITOR Animal Health Report. Thanks to all of the individuals at these laboratories who have worked to make this report possible.

- Arkansas Livestock and Poultry Commission Diagnostic Laboratory (Little Rock, AR)
- California Veterinary Diagnostic Laboratory System (Davis, CA)
- Bureau of Diagnostic Laboratories, Florida Department of Agriculture (Kissimmee, FL)
- Veterinary Diagnostic Laboratory, University of Georgia (Athens, GA)
- Veterinary Diagnostic and Investigational Laboratory, University of Georgia (Tifton, GA)
- Veterinary Diagnostic Laboratory, Iowa State University (Ames, IA)
- Animal Disease Diagnostic Laboratory, Purdue University (West Lafayette, IN)
- National Veterinary Services Laboratories (Ames, IA)
- Breathitt Veterinary Center, Murray State University (Hopkinsville, KY)
- Livestock Disease Diagnostic Center, University of Kentucky (Lexington, KY)
- Minnesota Veterinary Diagnostic Laboratory, University of Minnesota (St. Paul, MN)
- Veterinary Medical Diagnostic Laboratory, University of Missouri-Columbia (Columbia, MO)
- Veterinary Diagnostic Center, University of Nebraska-Lincoln (Lincoln, NE)
- Veterinary Diagnostic Services, New Mexico Department of Agriculture (Albuquerque, NM)
- New York State Veterinary Diagnostic Laboratory, Cornell University (Ithaca, NY)
- North Dakota Veterinary Diagnostic Laboratory, North Dakota State University (Fargo, ND)
- Reynoldsburg Laboratory, Ohio Department of Agriculture (Reynoldsburg, OH)
- Oklahoma Animal Disease Diagnostic Laboratory, Oklahoma State University (Stillwater, OK)
- Veterinary Diagnostic Laboratory, Oregon State University (Corvallis, OR)
- Puerto Rico Animal Diagnostic Laboratory (Dorado, PR)
- Clemson Diagnostic Laboratory, Clemson University (Columbia, SC)
- Animal Disease Research and Diagnostic Laboratory, South Dakota State University (Brookings, SD)
- C.E. Kord Animal Disease Diagnostic Laboratory, Tennessee Department of Agriculture (Nashville, TN)
- Pan American Veterinary Laboratories, (Austin, TX)
- Texas Veterinary Medical Diagnostic Laboratory, Texas A&M University (College Station, TX)
- Bureau of Laboratory Services, Virginia Department of Agriculture and Consumer Services (Richmond, VA)
- Central Animal Health Laboratory, Wisconsin Dept. of Agriculture, Trade and Consumer Protection (Madison, WI).
- Wyoming State Veterinary Laboratory (Laramie, WY)

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